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THE STAPELIEAE

BY

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VOLUME III

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1937



PLATE XXIII.

Tavaresia grandiflora Berger

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1932.

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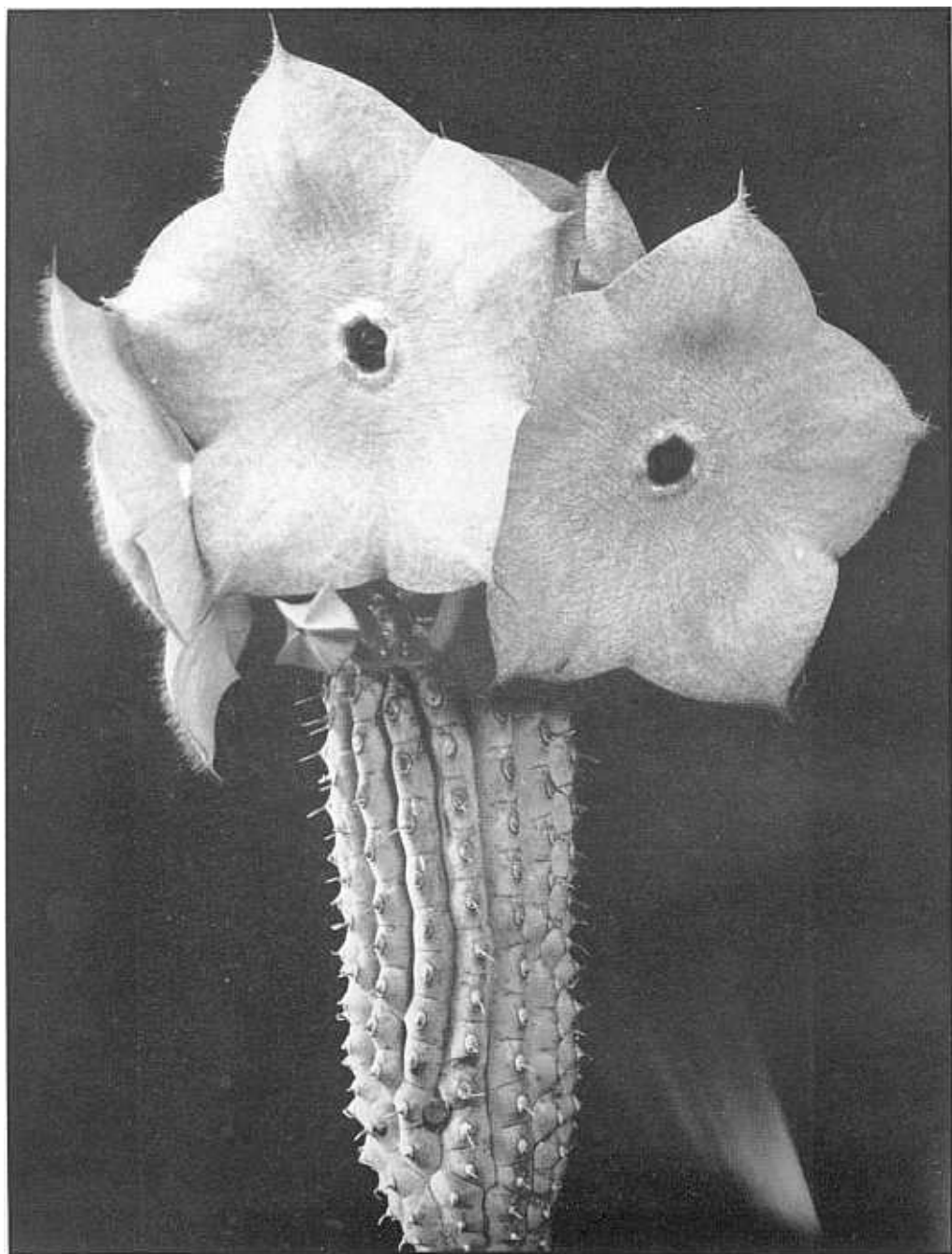
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THE STAPELIEAE



Hoodia currori Decaisne

Photo by Prof. Dinter.

HUERNIA R. Brown, Mem. Wern. Soc., i. 22. 1811.

Decodontia Haworth, Syn. Pl. Succ., 28. 1812.

Heurnia K. Schumann, Engler & Prantl: Pflanzenfam., iv. ii. 280. 1895.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 902):

Plants: perennial, succulent, dwarf; *stems* leafless, angular, simply toothed or sometimes with bristle-pointed teeth along the angles, glabrous;

Flowers: solitary or in small clusters near the base or middle of the young stems, of moderate size;

Calyx: 5-partite;

Corolla: wholly campanulate or with a short tube more or less constricted at its mouth and a very abruptly or horizontally spreading limb, 5-lobed, with 5 small teeth alternating with the lobes, formed by the projecting sinuses, in one species with the teeth and lobes of nearly equal size, both small and tooth-like, smooth, papillate or beset with simple or clavate hairs or processes on the inner surface;

Outer corona: spreading upon and more or less adnate to the bottom of the corolla-tube, disk-like and 5 to 10-crenate or toothed, or the disk with 5 distinct lobes, or the lobes free to the base, bifid, emarginate or rarely entire, entirely absent in one species;

Inner corona: arising from the upper part of the staminal column, of 5 simple lobes incumbent upon the backs of the anthers and equaling or exceeding them, subulate or clavate or thickened at the apex, often with a slight transverse dorsal ridge at their base, but no crest, wing or dorsal horn;

Pollen-masses: solitary in each anther-cell, subhorizontal, pellucid just within the straight margin near the free end, attached in pairs by short triangular caudicles to lateral wing-like expansions of the pollen-carrier.

Type species: *Huernia campanulata*.

Total species: 46.

Distribution: Southern Arabia, and Tropical and South Africa.

The genus *Huernia* was founded by Robert Brown upon *H. campanulata*, in an address delivered before the Wernerian Society in 1809 (printed in 1811). Brown coined the name in honor of Justus Heurnius, with an unfortunate slip in spelling (see Appendix A). The genus is characterized by the ten-toothed, or ten-lobed, form of the corolla; and Haworth, who had independently decided on the erection of a similar genus just a few months after Brown, coined the name *Decodontia* with reference to this feature. On learning of Brown's address, Haworth of course withdrew his name.

The stems of the *Huernias* are glabrous, mostly short and erect, branching usually at the base and building tufted sods. They

are mainly four or five-angled, but in some cases have more angles, *H. pillansii* having 20 to 24. The stem teeth are sometimes very prominent, rarely tipped with soft bristles and bearing rudimentary leaves only in a few tropical species.

The flowers generally grow in small clusters near the base of the stems and develop in succession. They are normally bell-shaped and often have the disk and lobes of the corolla flaring abruptly from the central tube, in some species with a prominent annulus. The corolla, as already noted, is 10-pointed, the conventional five lobes being supplemented by five smaller pointed tips at the sinuses. These "intermediate *Huernia* points" vary greatly in size as between different species, but they



FIG. 829

Huernia keniensis R. E. Fries

Example of *Huernia* (Key: Group I) with corolla-tube not over $\frac{1}{2}$ inch deep and the disk with annulus absent or indistinct. Type of flower with corolla bell-shaped and lobes not flaring abruptly from the tube.

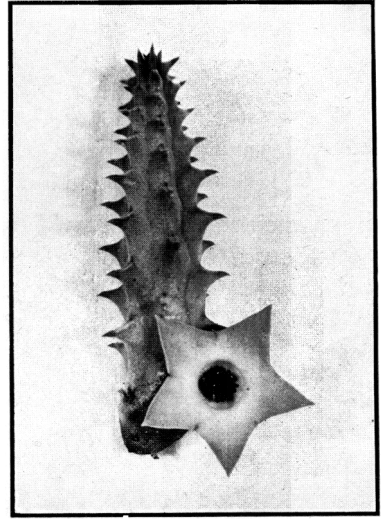


FIG. 830

Huernia primulina N. E. Brown

Example of *Huernia* (Key: Group I) with corolla-tube not over $\frac{1}{2}$ inch deep and the disk with annulus absent or indistinct. Type of flower having the corolla-lobes flaring abruptly from the tube; inner surface glabrous and smooth.

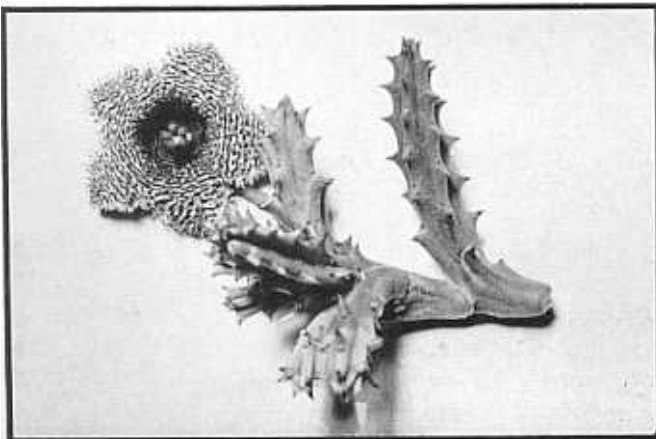


FIG. 831

Huernia hystrix N. E. Brown

Example of *Huernia* (Key: Group I) with corolla-tube not over $\frac{1}{2}$ inch deep and the disk with annulus absent or indistinct. Type of flower having the corolla-lobes flaring abruptly from the tube; inner surface hairy or papillate.

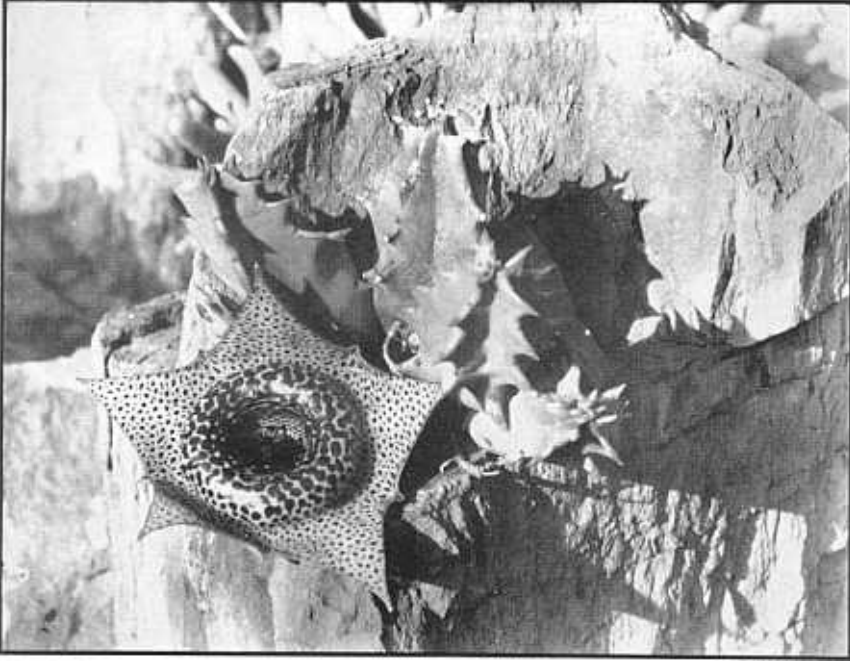


FIG. 832

Huernia guttata R. Brown

Example of *Huernia* (Key: Group II) with the corolla-tube not over $\frac{1}{2}$ inch deep and the disk with a prominent annulus. Photo by H. Herre. The identification is uncertain.

furnish ready evidence that the flowers which possess them belong to the genus, although minor manifestations of a similar character will be found in the genus *Stapelianthus*, as well as in *Caralluma carnosa* and *C. keithii*. The corolla of the *Huernias* is more generally beset with hairs, papillae and other processes on the inner surface than is the case with the flowers of other genera, presumably to provide obstacles against the approach of certain insects and the escape of others. Only two species are wholly glabrous and smooth: *H. primulina* and *H. thureti*.

In *H. simplex*, the outer corona is absent; in the remaining species it is disk-shaped; the lobes often bifid, forming distinctive 10-pointed designs. The inner corona assumes four principal types, which are so helpful as guides in the classification of the different species that K. Schu-

mann and A. Berger divided the genus into four sections on the basis of these coronal forms:

Section 1. *Plagiostelma* K. Schumann, Engler & Prantl: Pflanzenfam., iv. ii. 280. 1895. Inner corona-lobes incumbent upon the anthers, and not materially prolonged above them. The name means "Slanting crown, or corona." Many tropical species are included in this section.

Section 2. *Orthostelma* K. Schumann, Engler & Prantl: Pflanzenfam., iv. ii. 280. 1895. Inner corona-lobes bent over the anthers and then produced above them in gradual curves, terminating in erect points. The name means "Upstanding corona."

Section 3. *Calostelma* Berger, Stap. und Klein., 168. 1910. Inner corona-lobes produced above the anthers, but terminated in thickened, knob-like and minutely papillate

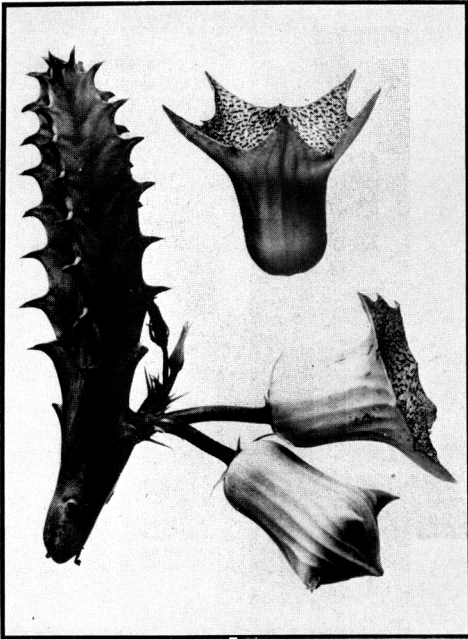


FIG. 833

Huernia longituba N. E. Brown

Example of *Huernia* (Key: Group III) with the corolla-tube more than $\frac{1}{2}$ inch deep, not prominently contracted at the middle. Photo: G. W. Reynolds, Johannesburg.

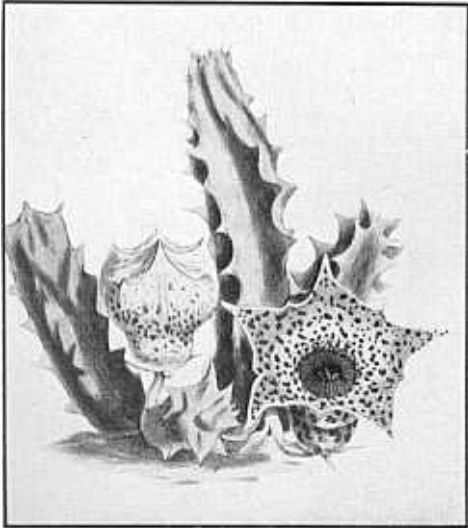


FIG. 834

Huernia campanulata R. Brown

From Curtis's Botanical Magazine, 1809.
Example of *Huernia* (Key: Group IV) with the corolla-tube more than $\frac{1}{2}$ inch deep, prominently contracted at the middle.

tips. The name means "Beautiful corona."

Section 4. *Podostelma* Berger, Stap. und Klein., 172. 1910. Inner corona-lobes quite straight, terminating above the anthers in a club-like tip, resembling a small inverted foot. The name means "Foot-shaped corona."

These sections must not be considered absolute, for in *H. schneideriana* the inner corona-lobes share in the characters of both sections 1 and 4, and in *H. brevirostris* the type falls in one section, while some of the varieties belong in another. Nevertheless these inner coronal distinctions are most helpful in the identification of the *Huernias*, especially in the *Macrocarpa-brevirostris* group, where the number of species is relatively large.

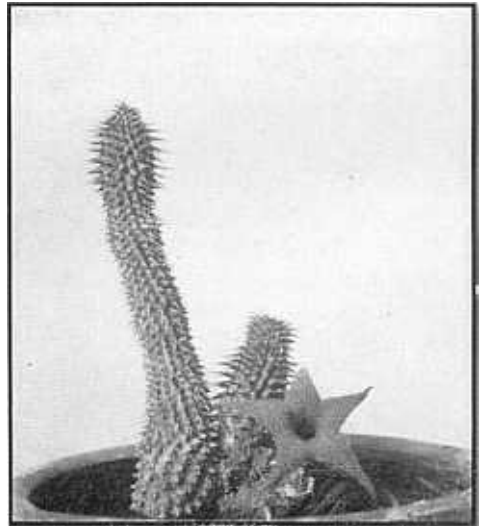


FIG. 835

Huernia pillansii N. E. Brown x 0.75

From W. I. Beecroft Gardens. Photo by Havens.
Example of *Huernia* (Key: Group V) with miscellaneous features. Plant with many-angled stems.

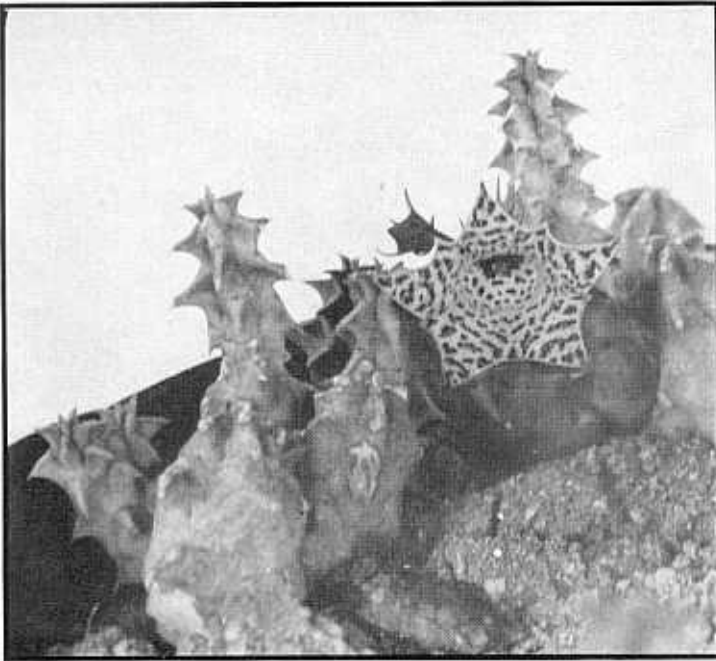


FIG. 836

An unidentified *Huernia*, collected by H. Herre near Lekkersing, Little Namaqualand. The short, sharply toothed stems are very characteristic. The flowers appear to be related to the *Brevirostris* Group, but the spots on the corolla are distinct in character and there is no uniformly dark purple area at the bottom of the tube. We believe this striking plant will prove to be a new species and, pending further description, we have given it the name of *Huernia herrei*, nom. prov.

Photo by H. Herre

KEY TO THE GENUS HUERNIA.

- I. Plants and flowers with the following "normal features": plant stems not more than 7-angled; flowers with both an outer and inner corona:
 - A. Corolla-tube not over $\frac{1}{2}$ in. deep:
 1. Annulus absent or indistinct (*Macropcarpa-brevirostris* group) Group I
 2. Annulus apparent or prominent (*Somalica-guttata* group) Group II
 - B. Corolla-tube over $\frac{1}{2}$ in. deep:
 1. Tube not contracted from the outside, so that the flowers appear somewhat cylindrical (*Longituba* group) Group III
 2. Tube contracted from the outside, so that the flowers appear like a wide-mouthed bell (*Campanulata* group) Group IV
- II. Plants or flowers without all the "normal features" (*Miscellaneous* group) Group V

Huernia. GROUP I. (Macrocarpa-brevirostris group).

(Corolla-tube not over $\frac{1}{2}$ in. deep; annulus absent or indistinct)

- I. Inner corona-lobes incumbent on the anthers and not produced above them:
 - A. Corolla uniformly purple (Color unknown in *H. similis*):
 1. Corolla papillate inside and out:
 - a. Corolla purple, corona contrasting yellow 1. *H. aspera* ($\frac{3}{4}$ in.)
 - b. Corolla and corona both purple:
 - i. Stems 5-angled, not sharply toothed 2. *H. keniensis* (1 in.)
 - ii. Stems 5 to 7-angled, very sharply toothed 8(c). *H. macrocarpa* var. *penzigii* ($\frac{3}{4}$ in.)
 2. Corolla papillate inside, glabrous and smooth outside 3. *H. similis* ($\frac{1}{2}$ in.)
 3. Corolla without papillae, inside and out 2(a). *H. keniensis* var. *molonyae* ($1\frac{1}{4}$ in.)
 - B. Corolla uniformly creamy to primrose 4. *H. primulina* (1 in.)
 - C. Corolla with tube and lobes contrasting in color:
 1. Tube blackish, lobes rosy-brown 5. *H. schneideriana* ($\frac{3}{4}$ in.)
 2. Tube whitish, lobes blackish-purple 6. *H. oculata* ($\frac{3}{4}$ in.)
 3. Tube white to reddish, lobes pale green 7. *H. verekeri* (1 in.)
 - D. Corolla yellowish, spotted or banded in purple:
 1. Corolla yellow, with fine closely-set purple lines 8. *H. macrocarpa* ($\frac{3}{4}$ in.) (see separate key)
 2. Corolla sulphur-yellow, with purple spots 9. *H. concinna* (1 in.)
 3. Corolla pale yellow, with crimson spots 10. *H. brevirostris* ($1\frac{1}{4}$ in.) (see separate key)

II. Inner corona-lobes produced above the anthers, but not thickened at apex:

A. Corolla with light markings on a dark ground color:

1. Corolla purple with white markings . . . 11. *H. albomaculata* ($\frac{3}{4}$ in.)
2. Corolla maroon with light yellow spots and lines . . . 12. *H. transmutata* ($1\frac{1}{4}$ in.)

B. Corolla with dark markings on a light ground color:

1. Corolla not papillate nor hairy . . . 13. *H. thureti* (1 in.)
2. Corolla minutely papillate on lobes only, with long stiff hairs at mouth of tube . . . 14. *H. piersii* ($1\frac{1}{4}$ in.)
3. Corolla papillate at mouth of tube, as well as on part of lobes:
 - a. Papillae tipped with hairs:
 - i. Corolla yellowish, with crimson spots, but no lines, on the lobes . . . 10. *H. brevirostris* vars.
 - ii. Corolla yellowish, with crimson lines and spots on the lobes . . . 15. *H. quinta* (1 in.)
 - b. Papillae not tipped with hairs:
 - i. Papillae ending in a minute bristle . . . 16. *H. namaquensis* (1 in.)
 - ii. Papillae ending in a minute mucro . . . 17. *H. nouhuysii* (1 in.)

C. Corolla with the tube sulphur-yellow, lobes dull black . . . 18. *H. witzenbergensis* ($1\frac{1}{4}$ in.)

D. Corolla whitish-yellow without markings:

1. Papillae on corolla tipped with clavate hairs . . . 10(e). *H. brevirostris* var. *immaculata* ($1\frac{1}{2}$ in.)
2. Papillae not tipped with any hairs . . . 16(a). *H. namaquensis* var. *immaculata* (1 in.)

III. Inner corona-lobes produced above the anthers, and thickened at apex:

A. Inner corona-lobes terminating in a small inverted foot . . . 19. *H. hystrix* ($1\frac{1}{4}$ in.)

B. Inner corona-lobes terminating in a small knob:

1. Outer corona-lobes subquadrate, almost truncate:
 - a. Corolla $1\frac{1}{2}$ in. in diameter, tube $2\frac{1}{2}$ lin. deep . . . 20. *H. stapelioides* ($1\frac{1}{2}$ in.)
 - b. Corolla not over 1 in. in diameter and tube proportionately deeper (4 lin. deep) . . . 21. *H. loeseneriana* (1 in.)
2. Outer corona-lobes linear and acutely pointed . . . 22. *H. volkartii* ($\frac{3}{4}$ in.)

Huernia. GROUP II. (Somatica-guttata group).(Corolla-tube not over $\frac{1}{2}$ in. deep; annulus apparent or prominent)

- I. Corolla-disk convex, forming an apparent annulus . 23. *H. somalica* ($1\frac{1}{4}$ in.)
- II. Corolla-disk raised into a prominent annulus:
 - A. Corolla-lobes with small more or less regular spots:
 - 1. Annulus covered with hair-tipped papillae, which continue down into upper part of tube 24. *H. praestans* ($1\frac{1}{2}$ in.)
 - 2. Annulus covered with papillae, hair-tipped only as they descend into upper part of tube 10(f). *H. brevirostris* var. *scabra* ($1\frac{1}{2}$ in.)
 - 3. Annulus glabrous, except for spine-like processes on inner margin only, these descending to upper part of tube 25. *H. guttata* ($1\frac{1}{2}$ in.)
 - 4. Annulus glabrous, tube with stiff clavate hairs on the upper part 26. *H. ocellata* ($1\frac{1}{2}$ in.)
 - 5. Annulus and tube glabrous:
 - a. Annulus sulphur-yellow with blood-red spots 27. *H. venusta* (2 in.)
 - b. Annulus blackish-purple with undulated whitish spots 28. *H. humilis* ($1\frac{1}{4}$ in.)
 - B. Corolla-lobes with large markings, irregular or confluent into patches and bands; annulus glabrous:
 - 1. Markings on corolla-lobes light red and scattering 29. *H. confusa* ($1\frac{1}{2}$ in.)
 - 2. Markings deep red, leaving only a slender net-work of the ground color visible . . . 30. *H. reticulata* ($1\frac{1}{2}$ in.)
 - 3. Markings purple-red, forming frequent irregular bands 31. *H. transvaalensis* ($1\frac{3}{4}$ in.)
 - C. Corolla-lobes marked with regular or broken bands; annulus glabrous:
 - 1. Corolla-lobes greenish-yellow with purple-brown bands 32. *H. zebrina* ($1\frac{1}{2}$ in.)
 - D. Corolla-lobes without markings; annulus glabrous:
 - 1. Annulus purple-brown; lobes pale rose . . 33. *H. insigniflora* ($1\frac{3}{4}$ in.)

Huernia. GROUP III. (Longituba group)

(Corolla-tube over $1\frac{1}{2}$ in. deep, not contracted from the outside, so that the flowers appear more or less cylindrical).

- I. Corolla-lobes not greatly larger than the alternating points at the sinuses between the lobes *H. d* *iden* in
- II. Corolla-lobes much larger than the alternating points:
 - A. Tube with a raised annulus within *H. le*
 - B. Tube with no raised annulus within *H. lo* in.)

Huernia. GROUP IV (Campanulata group)

(Corolla-tube over 1 in. deep, contracted from the outside, so that the flowers appear like a wide mouthed bell).

- I. Corolla-lobes erect, forming with the tube two distinct campanulate parts 37. *H. bicampanula* ($1\frac{1}{2}$ in.)
- II. Corolla-lobes horizontal or spreading, not forming a second campanulate part:
 - A. Inner corona-lobes produced above the anthers, but not thickened at the apex 38. *H. kirk* $1\frac{3}{4}$ in
 - B. Inner corona-lobes produced above the anthers, and thickened at the apex:
 - 1. Corolla papillate inside, but without long clavate purple hairs 39. *H. hislop* in.)
 - 2. Corolla papillate inside, with long clavate purple hairs:
 - a. Clavate hairs at middle of tube only, not extending to base of lobes 40. *H. campanulata* ($1\frac{1}{2}$ in.)
 - b. Clavate hairs extending up to base of lobes, or higher:
 - i. Corolla-lobes short, 3 to 4 lin. long; clavate hairs not extending beyond base of lobes . . 41. *H. clavigera* ($1\frac{1}{4}$ in.)
 - ii. Corolla-lobes 6 to 8 lin. long; clavate hairs variable, sometimes extending $\frac{2}{3}$ up the lobes . . 42. *H. barbata* (1 in.)

Huernia. GROUP V (Miscellaneous group)

(Stems or flowers lacking one of the following "normal features:" stems not more than 7-angled; flowers with both an outer and an inner corona).

- I. Stems with more than 7 angles
 - A. Stems 8 to 9-angled 43. *H. distincta* ($1\frac{1}{4}$ in.)
 - B. Stems 20 to 24-angled 44. *H. pillansii* (1 in.)
- II. Outer corona absent 45. *H. simplex* (1 in.)

1. *Huernia aspera* N. E. Brown, Gard. Chron., ii. 364. 1887.

(Description by Dr. Brown, Flora Trop. Afr., iv. i. 496):

Stems: procumbent and ascending, 3 to 9 in. long, $\frac{1}{2}$ in. thick, very obtusely 5 to 6-angled, glabrous; angles with small rigid spreading teeth (rudimentary leaves) $\frac{1}{2}$ lin. long, above each of which is a curved transverse impressed line connecting the grooves between the angles;

Flowers: 3 to 5 (or more) in sessile cymes near the base of the young shoots;

*Pedice*l: $\frac{1}{4}$ to $\frac{1}{3}$ in. long, glabrous;

Sepals: $\frac{1}{4}$ in. long, lanceolate, acuminate, very spreading, glabrous;

Corolla: campanulate, about $\frac{1}{2}$ in. long, $\frac{3}{4}$ to 1 in. in diameter, outside dull purple, very rough with numerous small pointed papillae; inside uniformly blackish-purple, densely covered with pointed papillae; *lobes* deltoid, acuminate;

Outer corona: lobes about $\frac{1}{3}$ lin. long and broad, subtruncate, slightly emarginate, intense blackish-crimson;

Inner corona: lobes $\frac{1}{2}$ to $\frac{2}{3}$ lin. long, lanceolate-subulate or linear, acute or obtuse, yellowish, their tips slightly exceeding the anthers and very slightly upturned, not produced into subulate points.

Type locality: Probably Tanganyika or Zanzibar.

Distribution. Unknown.

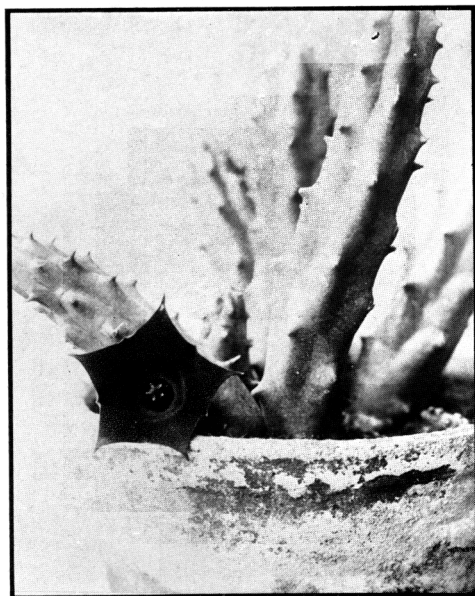


FIG. 837

Huernia aspera N. E. Brown x 1

Photo by F. Wiedemann.

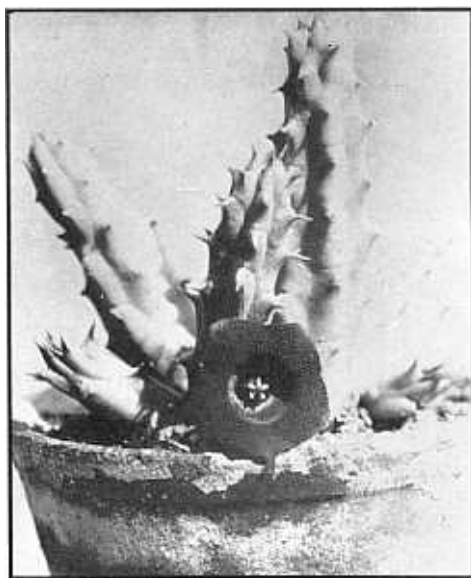


FIG. 838

Huernia aspera N. E. Brown x 1

Photo by F. Wiedemann.

Huernia aspera was introduced to the Royal Botanic Gardens, Kew, in 1887 by Sir John Kirk, who is believed to have collected it in Tanganyika, or perhaps in Zanzibar. The former appears the more likely, because of the presence of the closely re-

lated *H. keniensis* in neighboring Kenya. The name, the "rough *Huernia*," refers to the small papillae, rough to the touch, which cover alike the outer and inner surfaces of the small bell-like flowers. The stems are distinctive and separate the spe-

cies, along with *H. keniensis* and probably *H. similis*, from other *Huernias*. They have very obtuse angles, with tiny spreading teeth, above each of which is a curved impressed line running from groove to groove, dividing the angles into a series of little sections, which blend and grow indistinct

as the stems age and finally become almost circular in contour. The yellow inner corona-lobes contrast sharply with the purple tones of the other parts of the flowers and furnish perhaps the best clue for distinguishing the species from *H. keniensis*.

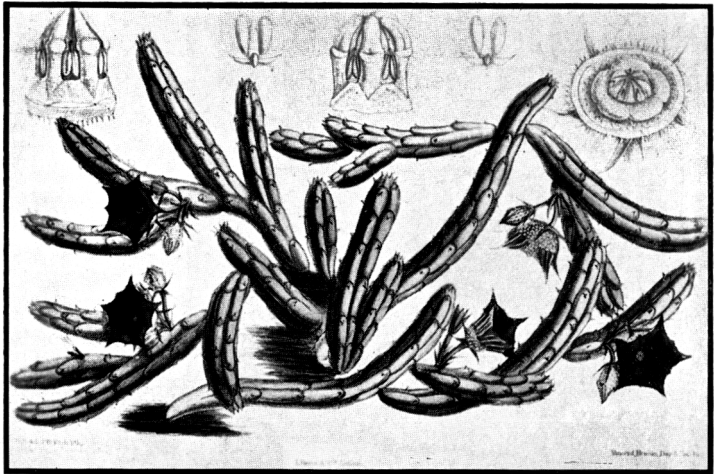


FIG. 839

Huernia aspera N. E. Brown
x 0.75

From Curtis's Botanical
Magazine, 1888.

2. *Huernia keniensis* R. E. Fries, Acta Hort. Berg., ix. 79. 1929.

(Description by Prof. Fries, l.c., translated from the Latin):

Stems: succulent, fleshy, decumbent or ascending, more or less bending, irregularly branching, glabrous, green or often more or less reddish, 5 to 15 cm. long, in cultivated plants occasionally much elongated and prostrate, 1 to 1.7 cm. thick, subterete or slightly 5-furrowed, the angles very little raised, obtuse, with tiny subulate spreading leaves 2 to 3 mm. long;

Flowers: from near the base of the stems, pendulous or horizontally decumbent towards the earth, solitary or in sessile cymes of 2 or 3;

Bracts: linear-subulate, very acute, 2 to 3 mm. long;

*Pedice*l: terete, glabrous, reddish, about 1 cm. long, in fruit growing out to 4 cm.;

Sepals: linear-subulate, very acute, more or less appressed to the corolla, glabrous, 5 to 6 mm. long;

Corolla: campanulate, rounded at the base, 2.5 to 2.8 cm. long, at the apex 2.5 to 3 cm. in diameter; outside scabrous or wart-like, reddish-purple, at the base and along the nerves pale and also covered with numerous little pale wart-like dots; within all deep dark purple, at the base smooth or minutely papillate, elsewhere (including the tube and lobes) densely covered with uniformly colored papillae; *lobes* broadly and shortly deltoid, acute, with concave sides, with 5 raised nerves on outer face, 4 to 5 mm. long and 12 to 14 mm. broad; intermediate lobes very small and tooth-shaped;

Outer corona: blackish-purple, slender, disk-shaped, circular, the edge slightly crenulate, about 4 mm. in diameter, closely appressed to the corolla and consequently hardly noticeable;

Inner corona: blackish-purple; lobes erect, about $3\frac{1}{2}$ mm. high, linear, slightly obtuse, bent at the centre, somewhat longer than the anthers;

Follicles: up to 10 cm. long.



FIG. 840

Huernia keniensis R. E. Fries x 1.

Photo by A. Probst and E. R. Svensson.

Type locality: Kenya: Westerly side of Mt. Kenya near Coles Mill at base of mountain about 6000 feet elevation.

Distribution: Also on Mt. Elgon.

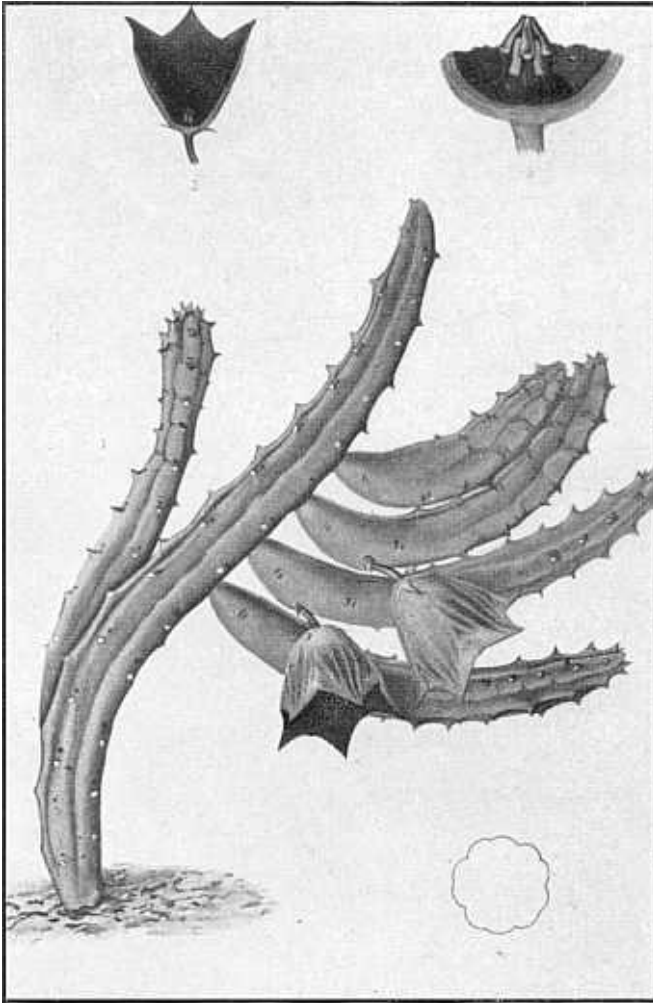


FIG. 841

uernia keniensis R. E. Fries x
From Acta Horti Bergiani, 1929.

Of all the STAPELIEAE, *Huernia keniensis* grows nearest to the Equator, for its home on Mt. Kenya, whence it derives its name, is within one degree of the Line. Mt. Kenya presents the paradox of a snow-capped mountain right at the Equator, yet the presence of perpetual snow is not altogether to be wondered at, since the altitude

of the mountain is over 17,000 feet. On the side of Mt. Kenya, especially on the westerly slope beginning at about 6,000 feet, there is a broad belt of desert flora, euphorbias, aloes and the like. *H. keniensis* was discovered on January 17, 1922, growing in profusion in this plant society, by two brothers, Professors Robert E. Fries and

Thure Fries. Its stems resemble those of *H. aspera* in becoming almost cylindric as they grow older, but they appear to be more slender and rather variable in habit, at times more distinctly toothed, and perhaps a little more erect. The flowers are larger and more bell-shaped, the lobes not flaring out as widely as in *H. aspera* and the tips less prominent. The intermediate "Huernia points" at the sinuses between the lobes are very small and best seen in the buds. An important feature to notice is that the inner corona-lobes are of the same dark purple color as the inner surface of the corolla, while in *H. aspera* they are of a contrasting yellow shade.

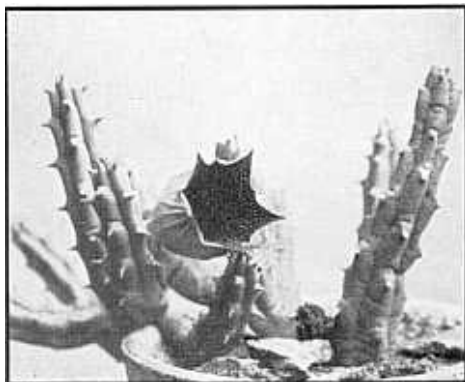


FIG. 842.

Huernia keniensis R. E. Fries x 0.75

Photo by F. Wiedemann.

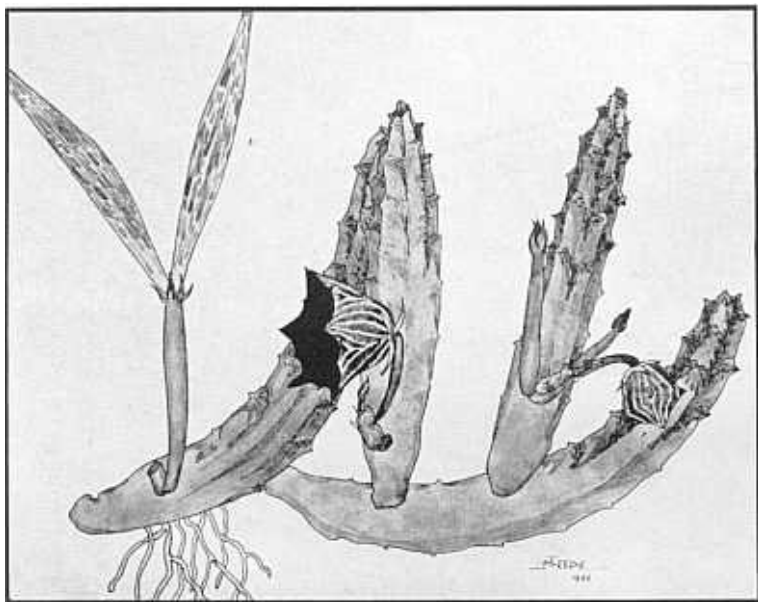


FIG. 843

Huernia keniensis R. E. Fries x 0.75

From a water color drawing by Mrs. D. R. Tweedie of a plant collected on Mt. Elgon, identified by the Herbarium of the Royal Botanic Gardens, Kew.

Var. a. *Huernia keniensis* var. *molonyae*, var. nov.

(Description by A. White and B. L. Sloane):

Stems: decumbent or ascending, irregularly branching, green or often reddish near the apex, subterete or slightly grooved, the angles obtuse with tiny transitory leaves;

Flowers: solitary or in small sessile cymes near the base of the stems, often pendulous;

*Pedice*l: reddish, about $1\frac{1}{4}$ cm. long;

Sepals: very acute, up to 1 cm. long;

Corolla: campanulate, rounded at the base, up to $3\frac{3}{4}$ cm. long and up to $3\frac{1}{2}$ cm. in diameter; outside smooth and glabrous and not at all scabrous or wart-like, reddish-purple or maroon, and not or very slightly tinted with green; inside all deep dark purple or almost dark blue, not papillate, but with a few scattered hairs; lobes up to $\frac{4}{5}$ cm. long and up to $1\frac{1}{2}$ cm. wide, broadly and shortly deltoid, acute; the intermediate lobes very small;

Corona: apparently as in *Huernia keniensis*.

Type locality: Kenya: along the edge of the rift valley near Nairobi.

Distribution: Not further known.

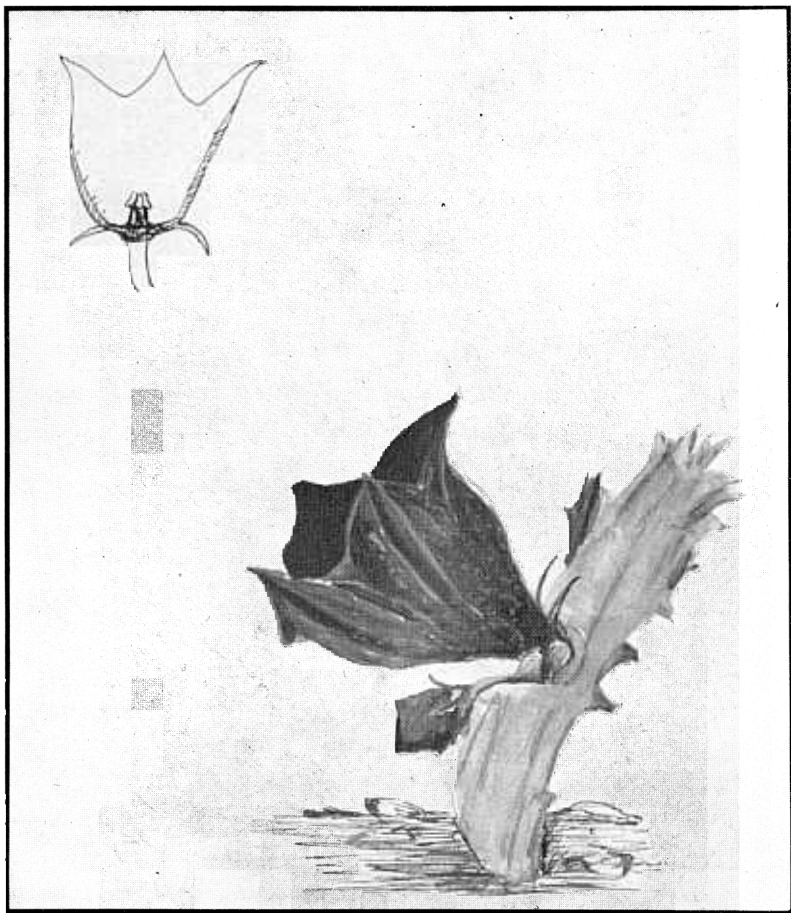


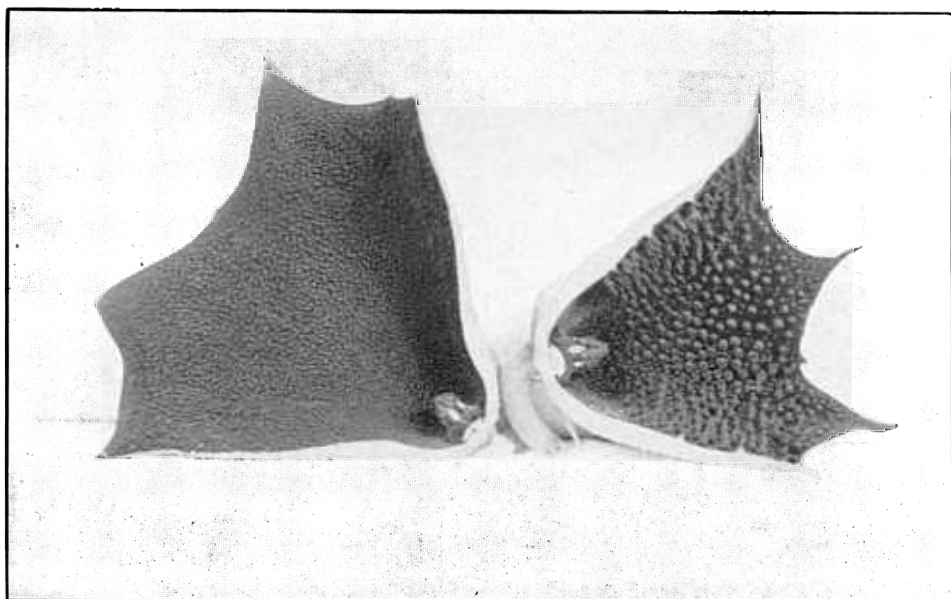
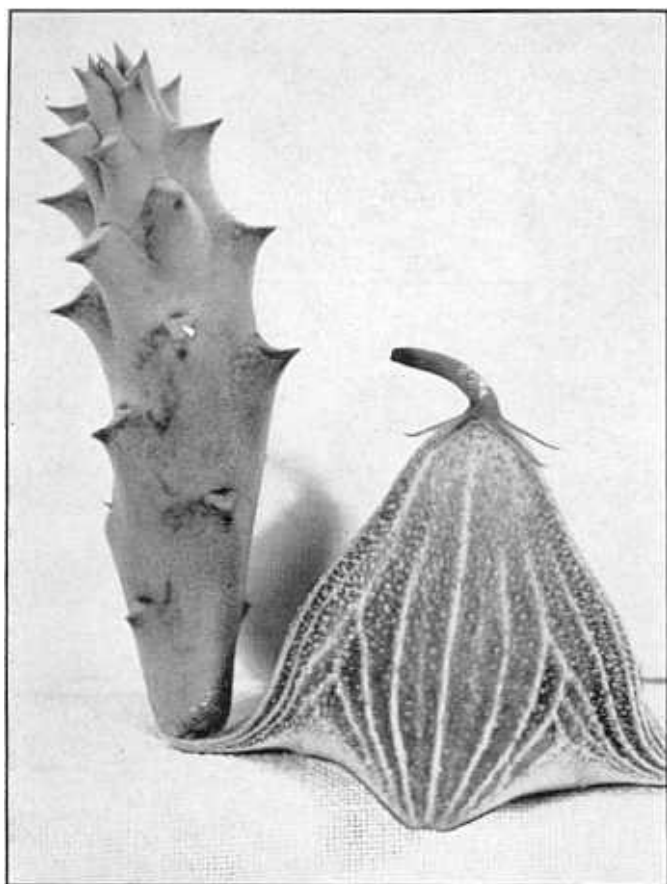
FIG. 844

Huernia keniensis var. *molonyae*, var. nov. x 2.

From a water color drawing by Mrs. E. R. Molony.

This new variety of *Huernia keniensis* shows several interesting deviations from the type. The stems are slightly more furrowed. The flowers are half as large again, and much darker on the outer face without the lighter green shading. But the principal difference is that the outer surface of the

corolla has none of the characteristic warts of *H. keniensis* and the inner face has no papillae at all, but only a few scattering hairs. We have named this variety for its discoverer, Mrs. E. R. Molony, formerly of the Coryndon Memorial Museum, Nairobi.



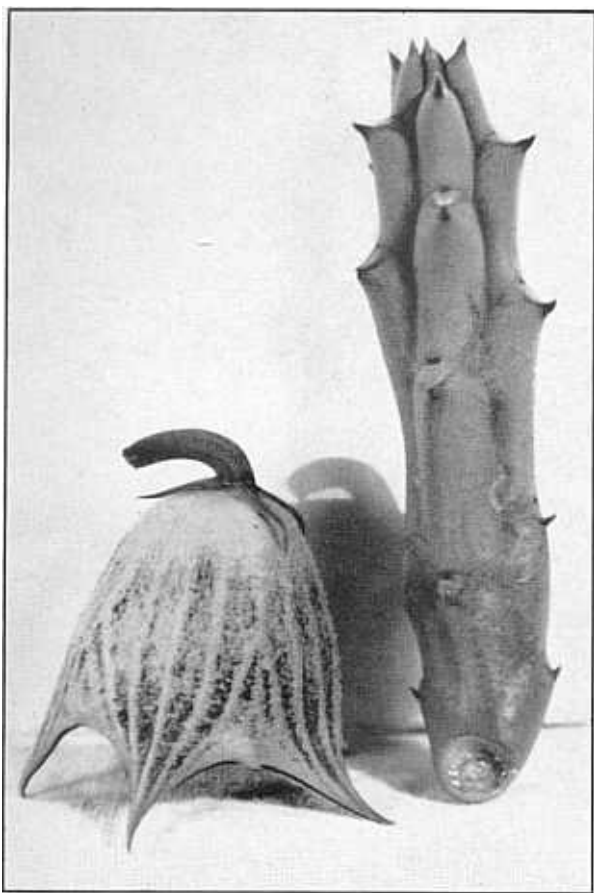


FIG. 847

Huernia keniensis R. E. Fries.

FIG. 848

Huernia keniensis

Comparison of var. *nairobiensis*, the larger flower, with the type of the species.

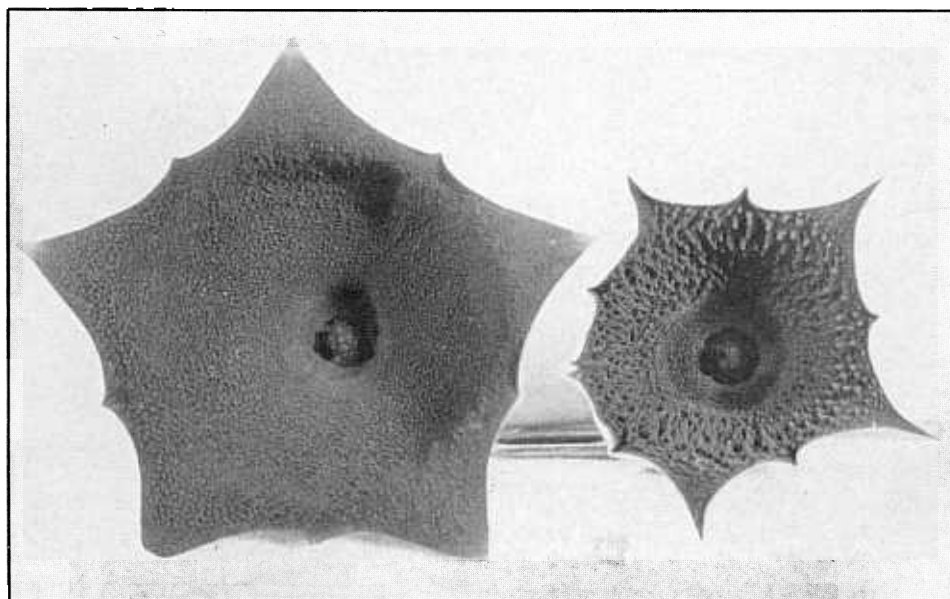




FIG. 849

Huernia keniensis R. E. Fries.

FIG. 850

Huernia keniensis R. E. Fries.

Var. b. *Huernia keniensis* var. *nairobiensis*, var. nov.

(Description by A. White and B. L. Sloane):

Varietas corona plus minus consimili ad typum accedit, ab eo tamen corolla ampliore, extus omnino scabra, intus papillosa papillis perminutis differt.

Stems: decumbent or ascending, irregularly branching, green, sometimes marked with purplish-brown, slightly grooved, up to 14 mm. thick and 3 to 12 cm. long; angles obtuse, with numerous prominent teeth on young stems which tend to become less conspicuous with age;

Flowers: solitary or in small sessile cymes near base of young stems, pendulous;

Pedicel: reddish, glabrous, 2 mm. thick, 7 mm. long;

Sepals: 5 mm. long, linear-subulate, acute;

Corolla: cone-shaped, up to 2.4 cm. long and 3.5 cm. in diameter; outside reddish-purple with prominent yellowish veins, entirely scabrous; inside deep reddish-purple, uniformly papillate with small papillae; *lobes* 5 mm. long, 16 mm. broad, broadly and shortly deltoid, acute, tips a lighter red and reflexed; the intermediate points very small;

Corona: as in the type, but somewhat smaller.

Type locality: Kenya: near Nairobi.

Distribution: Not further known.

This second variety, also sent us by Mrs. E. R. Molony from the neighborhood of Nairobi, again illustrates the diversity of forms assumed by *H. keniensis*, or perhaps we should say by *H. aspera*, for we believe the two species may eventually require to be united. The flower is a beautiful thing, not rounded at the bottom, as in the type,

but rather cone-shaped. The corolla is larger, more completely scabrid outside, and marked inside by the delicacy of the very small uniform papillae. Both these varieties might offer claims to be recognized as distinct species, if the corona in each case was not almost identical with that of the type.

3. *Huernia similis* N. E. Brown, Kew Bull., 265. 1895.

(Description by Dr. Brown, Flora Trop. Afr., iv. i. 495):

Stems: elongate, growing to 9 in. long, $\frac{1}{2}$ in. thick, cylindric, obtusely 5 (to 6?)-angled, glabrous; angles with small spreading teeth $\frac{1}{2}$ lin. long;*Flowers*: 3 to 5, in sessile or subsessile cymes near the base of the young shoots;*Pedice*l: $\frac{1}{2}$ to $\frac{3}{4}$ in. long, glabrous;*Sepals*: 2 lin. long, lanceolate, acuminate, very spreading, glabrous;*Corolla*: broadly campanulate, about 7 lin. in diameter and about half as long, outside glabrous, smooth; inside rough with small papillae; *lobes* spreading, deltoid, acuminate;*Outer corona*: lobes minute, about $\frac{1}{4}$ to $\frac{1}{3}$ lin. long and $\frac{1}{3}$ lin. broad, obtuse;*Inner corona*: lobes $\frac{1}{3}$ to $\frac{2}{3}$ lin. long, ascending, linear, obtuse, with a narrow transverse dorsal ridge at their base.*Type locality*: Angola: Pungo Andongo: in clefts of rocks on the mountain slopes of the Praesidium near Cabondo, Catete, etc.*Distribution*: Not further known.

Discovered by Welwitsch in Angola about 1855, but not described until forty years later. Named for its similarity to *Huernia aspera*. The $\frac{1}{2}$ -inch broadly bell-shaped flowers differ from the larger flowers of that species in being wholly smooth outside, but the inner surface is rough with small papillae. The plant has never been in cultivation and even the color of the flowers is unknown.

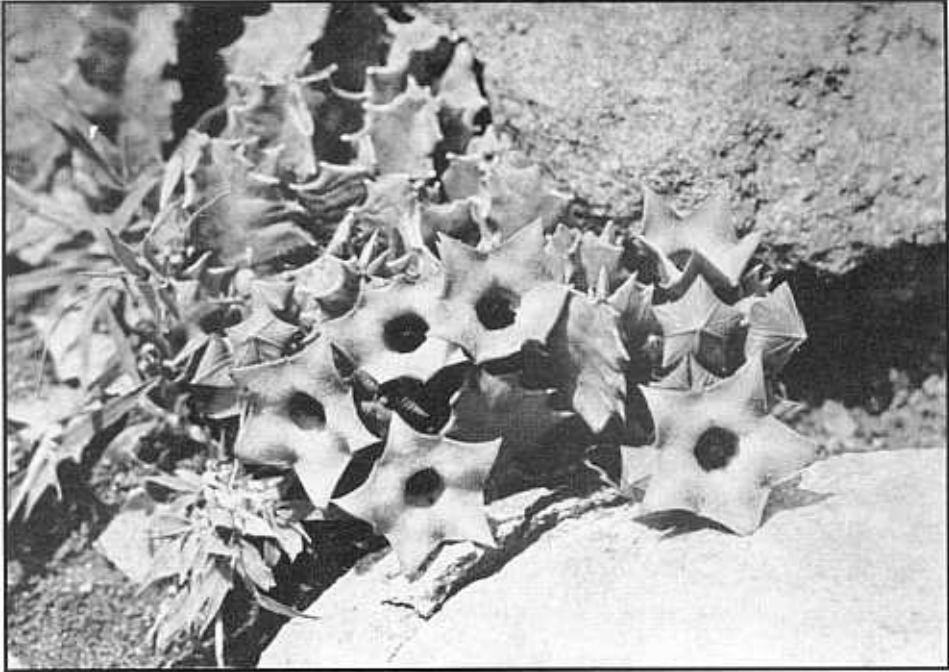


FIG. 851

Huernia primulina N. E. Brown x 1.

Plant growing in natural surroundings a few miles south of Cradock. Photo: G. W. Reynolds, Johannesburg.

4. *Huernia primulina* N. E. Brown, Icon. Pl., t. 1906. 1890.

(Description by Dr. Brown, Flora Cap., iv. i. 912):

Stems: $1\frac{1}{2}$ to $2\frac{1}{2}$ in. high, $\frac{1}{2}$ to 1 in. thick, excluding the teeth, acutely 4 to 5-angled, with more or less channeled sides, glabrous, glaucous-green, at least when young; angles with compressed deltoid teeth $1\frac{1}{2}$ to $2\frac{1}{2}$ lin. long, with dark-colored very acute recurving tips;

Flowers: in fascicles of 3 to 8 near the base of the young stems, 2 to 5 often being open at the same time;

*Pedice*l: $\frac{1}{2}$ to 1 in. long, glabrous;

Sepals: 2 to $2\frac{1}{2}$ lin. long, $\frac{3}{4}$ lin. broad, lanceolate-subulate, glabrous;

Corolla: in bud obtusely to very acutely pointed, acutely 5-angled; when expanded $\frac{3}{4}$ to $1\frac{1}{6}$ in. in diameter; *tube* globose-campanulate, $2\frac{1}{2}$ to $3\frac{1}{2}$ lin. long and as much in diameter outside, constricted at the mouth; *limb* horizontally spreading abruptly from the tube, sometimes very slightly raised around its mouth, with recurving lobes 3 to $4\frac{1}{2}$ lin. long, 3 to 5 lin. broad, deltoid, variably acute, smooth and glabrous outside and inside, entirely sulphur-yellow to golden-primrose, without markings or a purple area around the corona;

Outer corona: lobes $\frac{1}{2}$ to $\frac{2}{3}$ lin. long, subquadrate, bifid, crimson-black or purple-black;

Inner corona: lobes 1 to $1\frac{1}{4}$ lin. long, subulate, acute, with a slight transverse dorsal ridge at the base, connivent over the staminal column, with erect points, purple-brown.

Type locality: Cape Prov.: Albany Distr.: near Grahamstown.

Distribution: At other points in Albany Distr.; also in Uitenhage Distr.: Redhouse; Somerset East Distr.: Bruinjes Hoogte; Cradock Distr.: near Cradock; Tarka Distr.

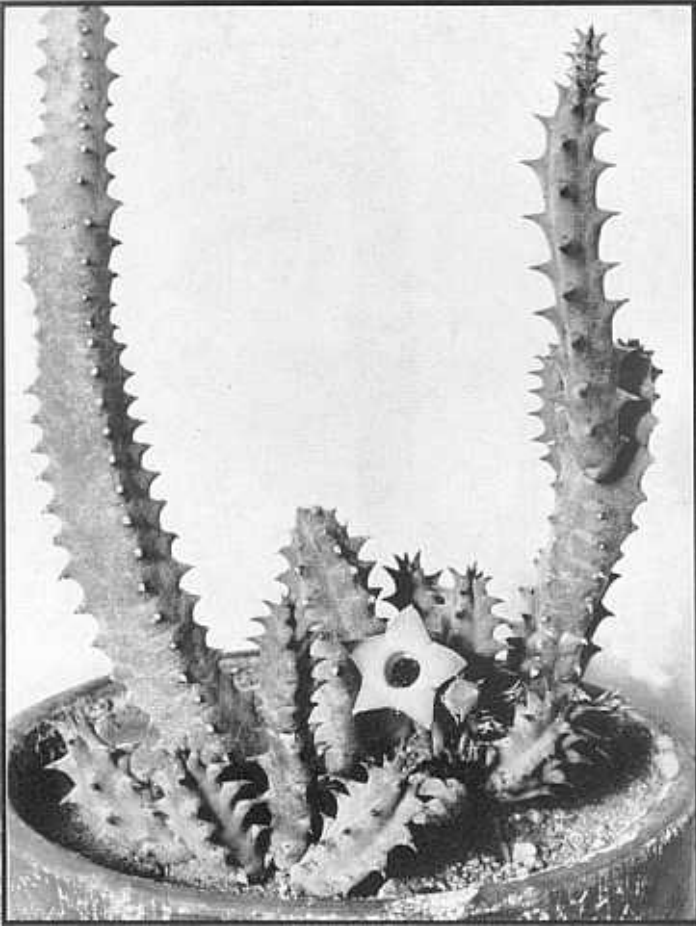


FIG. 852

Huernia primulina N. E. Brown x 1

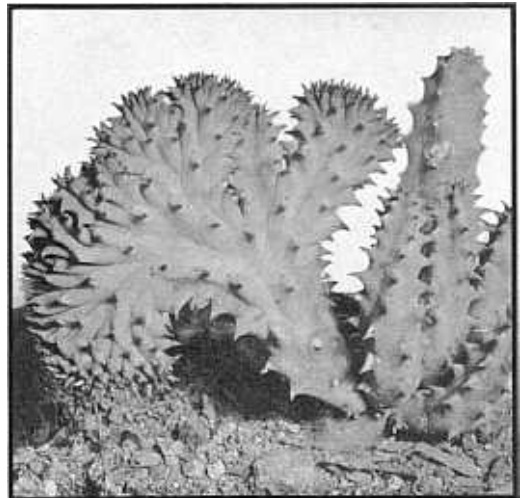


FIG. 853

Huernia primulina
N. E. Brown x 0.6

A crested stem.

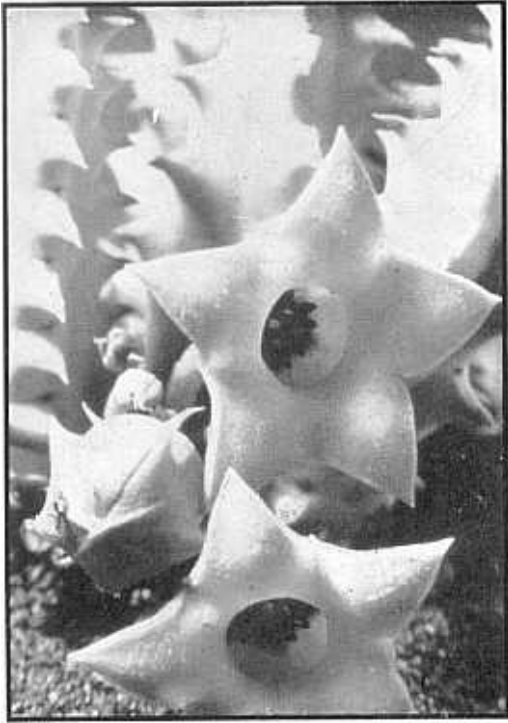


FIG. 854

Huernia primulina N. E. Brown x 3.

Photo by James West.

The "primrose *Huernia*" is a most delightful member of the genus, discovered by Col. Bowker in Sir Henry Barkly's day near Grahamstown, and introduced to Kew by Sir Henry prior to 1878. The stems build large tufts of an attractive shade of green. The flowers are smooth and glabrous, a rare condition among the *Huernias*, the corolla creamy-yellow to a beautiful tone of primrose, sometimes with a tinge of reddish-purple in the tube around the corona. The tube is globose in shape, the disk and lobes spreading away abruptly from its mouth, where the fabric in some flowers is raised and thickened into an inconspicuous ring. The corona is a thing of beauty, the

outer corona dark crimson-purple, with graceful bifid lobes, and the inner corona-lobes purple-brown and connivent upon the anthers, with the tips slightly erect above them.

H. primulina is a vigorous grower and flowers freely during the fall season, if given the least encouragement in the way of sun and heat. It is an excellent species for window culture in any warm sunny room. Many minor forms are found, the acumination of the buds and the intensity of color of the corolla differing noticeably in different plants. One variety has been recognized.



FIG. 855

Huernia primulina N. E. Brown

Plant growing in natural surroundings near Bruintjes Hoogte, Somerset East division.

Photo: G. W. Reynolds, Johannesburg.



FIG. 856

Huernia primulina N. E.
Brown

Two views of plants in natural surroundings, among rocks and grasses on the Peddie Road, Albany district, 4 miles west of Frasers Tower and about 20 miles east of Grahamstown.

Photos by G. W. Reynolds,
Johannesburg.

"These plants," writes Mr. Reynolds, "grow socially with *H. thureti*, and I believe the two hybridize, and that these figures may represent this cross, for while the flowers are structurally indistinguishable from those of the regular *H. primulina*, yet in color the corolla-lobes are quite a coral pink, intermediate between the color of the markings of *H. thureti* and the usual creamy color of *H. primulina*."

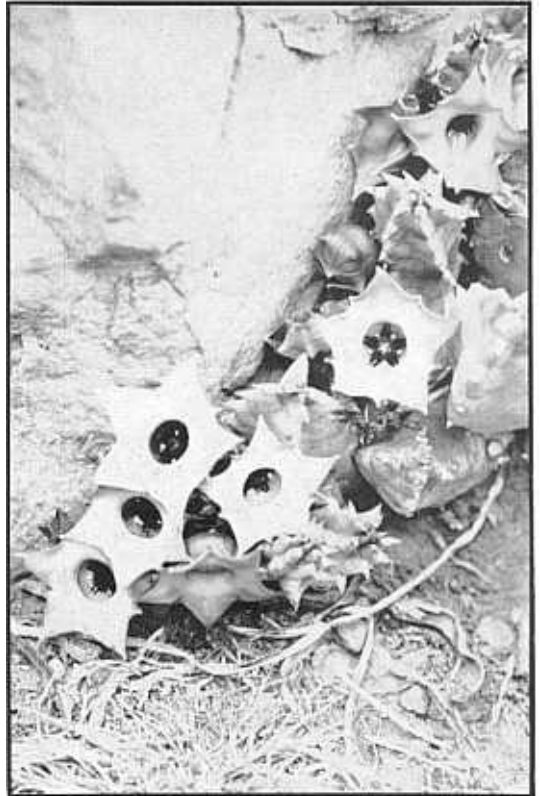


FIG. 857

H. primulina N. E. Brown

r. a. *Huernia primulina* var. *rugosa* N. E. Brown, Flora Cap., iv. i. 913. 1909.

Huernia flava N. E. Brown, Kew Rep., 7. 1878. (*Nomen nudum*).

In this variety, according to Dr. Brown, the disk is covered with small tubercles, which gradually decrease in size towards the tips of the lobes. It is found in the Albany district, sometimes mixed with the type, and also in Cradock and Queenstown districts. Mr. Pillans says that the stems

are of larger size and darker color than those of the type. The flowers are easily confused with those of *H. brevirostris* var. *immaculata*, the principal differences being that the latter are slightly larger, with the corolla studded in and around the mouth of the tube with hair-tipped papillae.

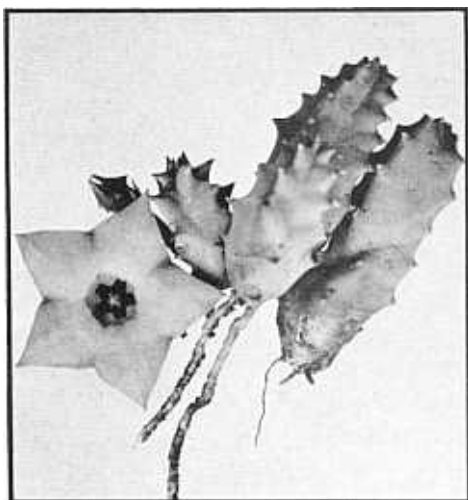


FIG. 858

Huernia primulina N. E. Brown x 1.

Photo: G. W. Reynolds, Johannesburg,
of a plant from Bruintjes Hoogte,
Somerset East district.

5. *Huernia schneideriana* Berger, Monatsschr. Kakt., 177. 1913.

(Description summarized from that by A. Berger, l.c., translated from the Latin):

Stems: tufted, glabrous, green, about 5 cm. high and 10 to 12 mm. thick, with 6 (or more rarely 7 - W. & S.) obtuse angles, with acute teeth and minute subulate leaves 1 to 2 mm. long;

Flowers: few, from the base of the stems;

*Pedice*l: short, glabrous;

Sepals: deltoid-subulate, glabrous, 3 mm. long;

Corolla: campanulate; outside brownish, glabrous, rugose, veined; inside brownish, papillose, with numerous acute black hairs; *tube* intensely black, minutely papillose, otherwise glabrous; *lobes* deltoid, cuspidate-acuminate, 8 mm. long, 6 to 7 mm. broad; intermediate lobes very minute;

Outer corona: lobes short, thickened at the base, entire;

Inner corona: lobes erect, with a deltoid apex, incumbent over the anthers, but shorter than them, at the knee-like joint projecting outward horizontally in a fleshy semi-ovate appendage; entire corona dark purple, velvety-papillose, 2 to 2½ mm. high.

Type locality: Nyasaland: near Kimbila, at the north end of Lake Nyasa.

Distribution: Also in Portuguese East Africa: Mangulane; and perhaps at Macalôge, in Portuguese Nyassa.

This very distinct species was discovered about 1912 near the upper end of Lake Nyasa by Adolf Stolz, an active collector of plants in East Africa at that period. It was named by Alwin Berger in honor of his friend, Camillo Schneider of Vienna. The plant is an important member of the tropical series of *Huernia*, with small bell-shaped flowers and the inner corona-lobes bent over the anthers and not produced upwards above them. But the inner corona-lobes differ from those of the more northern species in having a thickened dorsal projection at the knee-like joint, which very nearly connects the inner corona with the *Podostelma* section. The flowers are about an inch in size, the pale rosy-brown shade of the corolla-lobes contrasting abruptly with the intense black of the shallow central tube. The corolla-lobes flare out more prominently than in the flowers of the *H. macrocarpa* group, and the whole shape of the flowers is more nearly akin to that of *H. verekeri*. The sepals, however, do not project beyond the corolla sinuses, as they do so conspicuously in *H. verekeri* and in some flowers of the *H. macrocarpa* circle. The stems are among the most interesting of the *Huernia* stem-forms. They are cylindrical in outline beneath the 6 or

7 obtuse angles and much less fiercely toothed than the stems of *H. macrocarpa*. Their character is all their own, and it can

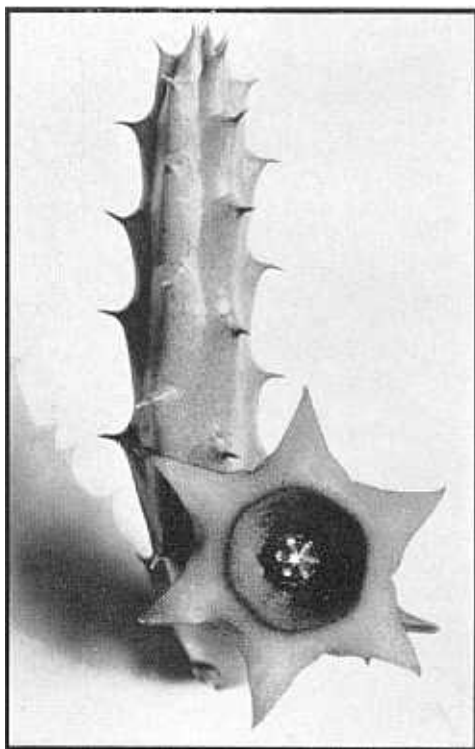


FIG. 859

Huernia schneideriana Berger x 2.

A six-lobed flower.

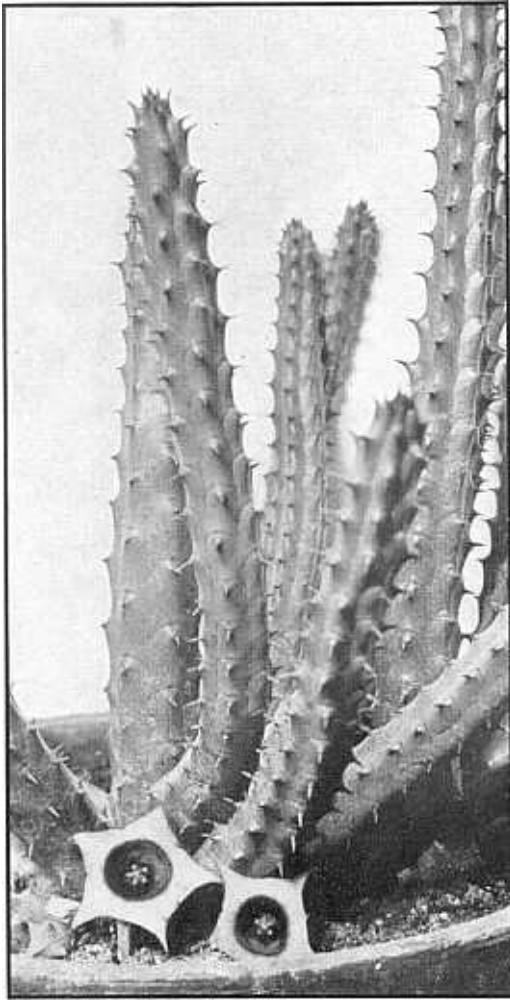


FIG. 860

Huernia schneideriana Berger x 0.75

be better visualized from the photographs than from the formal description. Grown in the open, the stems build closely tufted mats, $1\frac{1}{2}$ to 2 inches high and sometimes two or three feet in diameter; while under glass they become extraordinarily elon-

gated, to nearly two feet long; remaining erect or bending of their own weight. Grown in a hanging pot and well watered they will hang around the pot with a tropical luxuriance which never fails to attract attention.

6. *Huernia oculata* Hooker fil., Bot. Mag., t. 6658. 1882.*Huernia rogersii* R. A. Dyer, Rec. Alb. Mus., 468. 1927.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 496):

Stems: 2 to $3\frac{1}{2}$ in. high, about 5 to 6 lin. thick (without the teeth), 5-angled, glabrous; angles with stout fleshy spine-like teeth 2 to $4\frac{1}{2}$ lin. long;*Flowers*: few, in sessile cymes near the base of the young stems;*Pedice*l: 2 to 3 lin. long, glabrous;*Sepals*: 3 to 4 lin. long, lanceolate-subulate, glabrous;*Corolla*: about 10 lin. in diameter, minutely papillate-asperate inside and outside, otherwise glabrous and not ciliate, green, more or less tinged with purplish outside, blackish-purple on the lobes and upper part of the tube within, the base of the tube white; *tube* about $\frac{1}{4}$ in. long, broadly campanulate; *lobes* $2\frac{1}{2}$ lin. long, deltoid, acuminate, spreading;*Outer corona*: lobes about $\frac{1}{2}$ lin. long and broad, subquadrate, truncate or slightly emarginate (not rounded as represented in the plate in Bot. Mag.), glabrous;*Inner corona*: lobes $\frac{3}{4}$ lin. long, elongate-deltoid, with a dorsal transverse ridge at their base, minutely puberulous, connivent, but without erect tips

Type locality: South West Africa: Hereroland.

Distribution: Recorded from near Omaruru, Omburu, and Okahandja (rare).

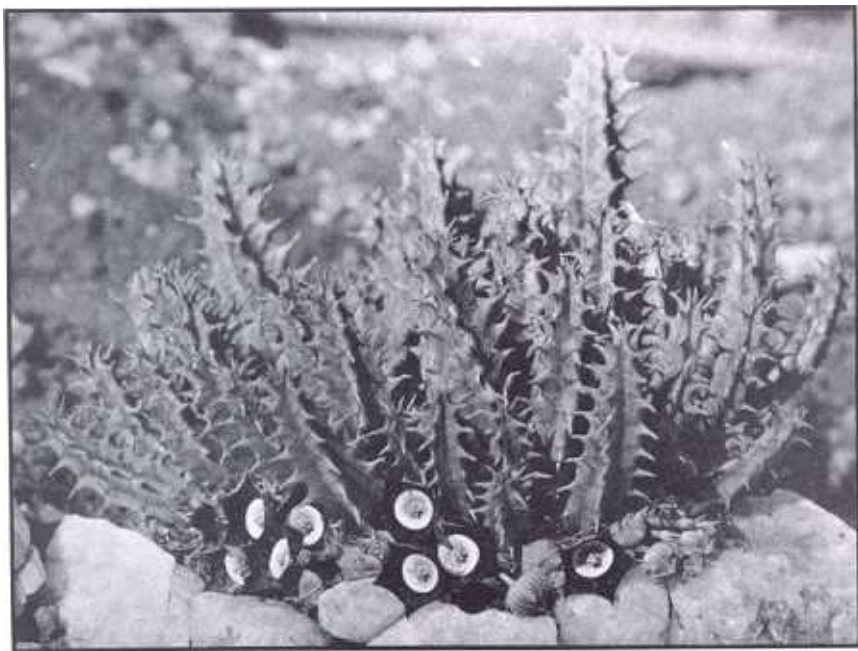


FIG. 861

Huernia oculata Hooker fil. x 0.75

Photo by W. Triebner.

This delightful *Huernia* was brought home in 1880 from Hereroland in tropical South West Africa by the Danish trader-botanist, Thure Gustave Ein (or Een). It

is well named, the "eye-flowered *Huernia*," because of the blackish-purple flare of the corolla and the contrasting whitish base of the central tube. The combination of the



Cythna
Letty.

PLATE XXIV.

Huernia oculata Hooker fil.

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1936.

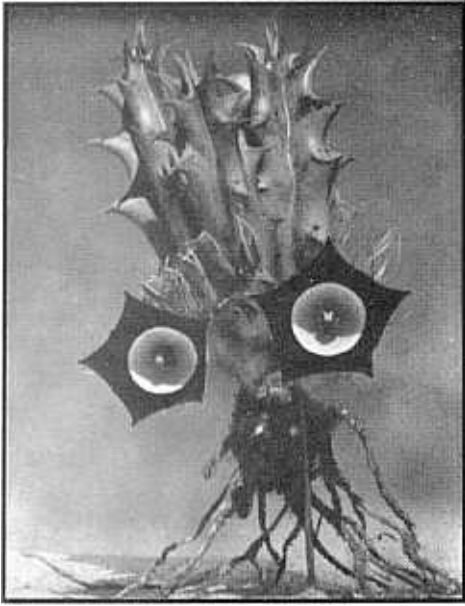


FIG. 862

Huernia oculata Hooker fil. x 1.

Photo by Prof. Dinter in Neue Pfl. D. S.-W. Afr. 1914.

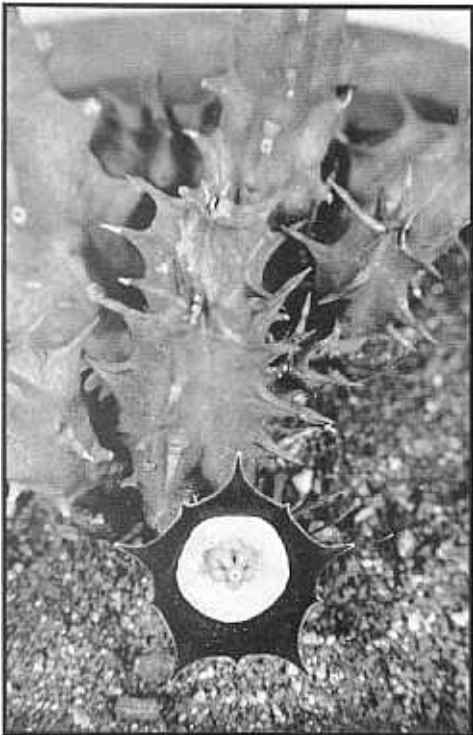


FIG. 863

Huernia oculata Hooker fil. x 1.25

light and dark colors is just reversed from that in *H. schneideriana*. The stems somewhat resemble those of *H. macrocarpa* var. *penzigii*, but they are a little taller, 3 to 5 inches.

In 1927 R. A. Dyer described a modified form of the species under the name of *H. rogersii*, which he now considers is to be regarded as a synonym only. In this form, which is also native to tropical South West Africa, the corolla-tube is a little more shallow and the outer corona is circular instead of five-lobed.

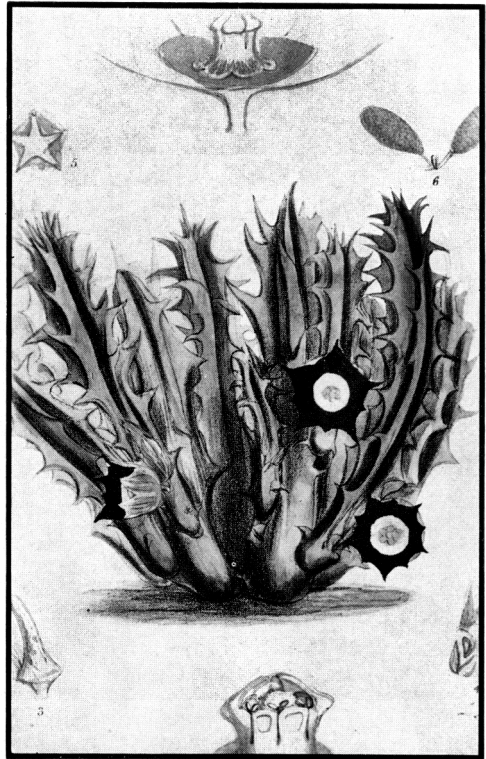


FIG. 864

Huernia oculata Hooker fil. x 0.75

From a drawing by Lady Thiselton-Dyer in Curtis's Botanical Magazine, 1882.



FIG. 865

Huernia verekeri Stent x 2.4

7. *Huernia verekeri* Stent, Kew Bull., 145. 1933.

(Description by Miss Sydney M. Stent, l.c., translated from the Latin):

Stems: about 3.5 cm. high, glabrous, 5 to 7-angled; teeth up to 8 mm. long, narrowly acuminate from a deltoid base;

Flowers: in fascicles of 1 to 3, from the base of the stems;

*Pedice*l: 8 mm. long, glabrous, green;

Sepals: about 7 mm. long, ovate, acuminate, narrowing to a long slender point, glabrous;

Corolla: tube shallow, cup-shaped, 4 mm. long and 9 mm. in diameter, white at the base, almost reddish near the mouth, glabrous except for some bristle-like hairs at the mouth; lobes horizontally spreading, 7 mm. long, pale yellow-green, covered with minute purple bristle-like hairs; the intermediate points at the sinuses between the lobes small and reflexed;

Outer corona: disk-shaped, fleshy, white;



PLATE XXV.

Huernia verekeri Stent

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1935.

Inner corona: lobes incumbent on the anthers, but shorter than them, with quite a large flat broadly rounded dorsal crest, white or slightly suffused with rose.

Type locality: Southern Rhodesia: Sabi River Valley, near the border of Mozambique.

Distribution: Also in Wankie Distr.: clay pits, Dekka Road.

This curious *Huernia* is named for L. S. A. Vereker, of Salisbury, Southern Rhodesia. Mr. Vereker writes us: "I fear that its discovery was not strictly my own. My wife and I and my assistant, D. H. Townley, were on a collecting trip. Mr. Townley is not a plant collector, but a keen naturalist, specializing in birds and emperor moths. We had motored down the Sabi Valley close to the Mozambique border, a low and waterless country, where the annual rains average 9 inches and the maximum shade temperature each summer is about 120°. Mr. Townley was bird hunting, and brought back a withered plant which I thought was our common *H. hislopii*. I

threw it away, but later having my doubts I searched the locality on our return journey and found a plant of *H. verekeri* in bloom." The distinctive feature of the type of "Vereker's *Huernia*" is a *Duvalia*-like outer corona, a thickened round disk, without separate lobes. The inner corona is also characteristic, the lobes incumbent on the anthers with a broadly rounded dorsal hump at the bend. This is a little reminiscent of the inner corona of *H. schneideriana* from Nyasaland, and the whole relationship of *H. verekeri* is towards the north. The boldly toothed stems recall those of *H. macrocarpa*, and the small flowers, with flaring lobes contrasting in color with the shallow central tube, again suggest *H. schneideriana*, although the particular combination of the colors, pale yellow-green lobes with a purplish pubescence contrasting with the reddish throat of the cup, is not at all the same as in that species. Finally the intermediate *Huernia* points at the sinuses between the corolla-lobes are very small, as in several of the northern *Huernias*, and are hardly visible except from below; whereas the sepals are prolonged out well beyond these intermediate points.

We have received from Capt. R. H. R. Stevenson a flower collected by him southwest of Sawmills, in which the outer corona differs markedly from the type in having well developed truncate lobes, each lobe notched at the centre into two broadly rounded segments. The plants of this var. *stevensonii* were found growing in a clay deposit in the old bed of the Umguza River. They were distributed in a very limited area in small clumps and must, during floods, be periodically submerged by the flood waters.

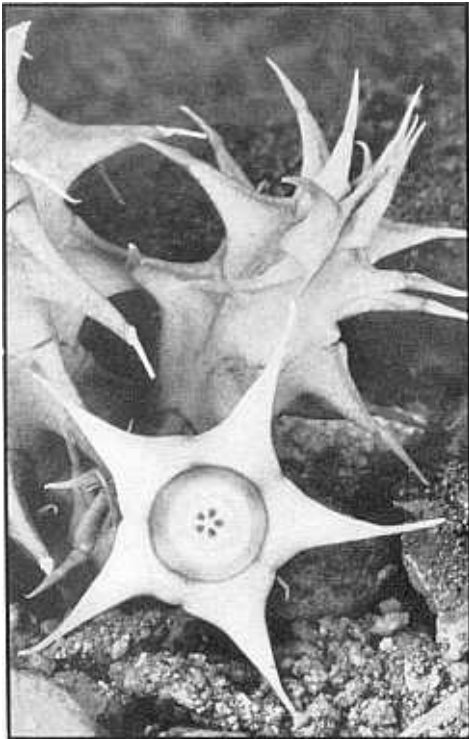


FIG. 866

Huernia verekeri Stent x 2.

Photo by Herbert Lang of the type plant.

Var. a. *Huernia verekeri* var. *stevensonii*, var. nov.

(Description by A. White and B. L. Sloane):

Stems: erect, glabrous, 5-angled; angles somewhat compressed, with stout conical spreading and slightly upturned teeth;

Flowers: 2 or a few more together at the sides of the stems, a little above the base, successively developed;

Pedicel: 1.5 mm. thick, glabrous;

Sepals: 9 mm. long, extending conspicuously beyond the sinuses of the corolla-lobes, ovate-lanceolate, acuminate, with a ridge down the middle, curved or twisted at the apex, glabrous;

Corolla: 3 cm. in diameter, glabrous and smooth outside; *tube* shallow saucer-shaped, reddish-brown on the inside, glabrous, shining, 8 mm. in diameter; *lobes* 12 mm. long, 6 to 8 mm. wide, spreading abruptly from the tube, subreflexed at the margins, acuminate, greenish with a minute purple pubescence, not ciliate; intermediate points at the sinuses between the lobes minute;

Outer corona: 3.5 mm. in diameter; lobes much broader than long, subtruncate, emarginate, whitish or whitish-green;

Inner corona: lobes 1 mm. long, 0.75 mm. wide, incumbent on the anthers, with a prominent dorsal gibbosity at the bend, pinkish-brown.

Type locality: Southern Rhodesia: Nyamandhlovu Distr.: in river bed silt in the Umguza River Valley near Sawmills.

Distribution: Not further known.

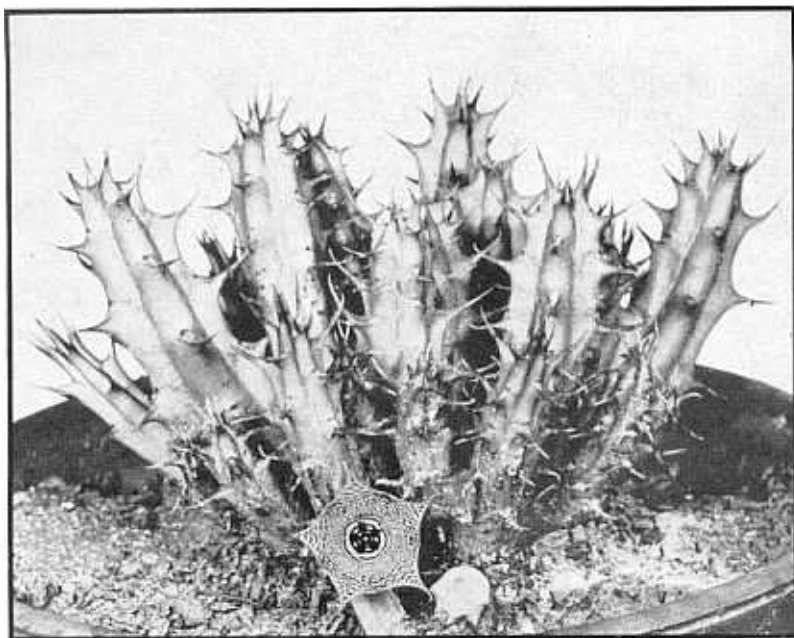


FIG. 867

Huernia macrocarpa Sprenger x 0.8

8. *Huernia macrocarpa* (A. Richard) Sprenger, Dammann: Cat., 4. 1892.

Stapelia macrocarpa A. Richard, Tentamen Flora Abyss., ii. 50. 1851.

Huernia penzigii var. *schimperi* Berger, Stap. und Klein., 143. 1910.

(Description by A. White and B. L. Sloane, based in part on the descriptions by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 498, and K. Schumann, Monatsschr. Kakt., iv. 155, 1894, translated from the German):

Stems: "about the length of a finger, fleshy, glaucous, subquadrate (?) ; angles coarsely toothed; teeth fleshy, acute, recurved, spinescent at the apex" (*Brown*) ; "up to 9 cm. long, cylindrical just at the base, then acutely 5-angled; teeth 7 to 8 mm. long, 3.5 to 4 mm. thick at the base, separated by sinuses along the stem-angles 6 to 8 mm. wide" (*Schumann*) ;

Flowers: 1 to 4 from the base of the young stems;

Pedice: 5 mm. long, pale green, glabrous;

Sepals: 10 mm. long, 1 mm. broad at the base, gradually tapering to a very fine hairlike point, glabrous;

Corolla: "campanulate, somewhat more than 1 cm. long, and 2 cm. at the greatest diameter; lobes broadly triangular, acute, with an intermediate point hardly 1 mm. long in the flat sinuses between; outside greenish-yellow, inside brighter yellow with crowded purple-red concentric lines and spots" (*Schumann*) ; outside whitish-yellow, prominently 5-nerved, minutely papillate, glabrous; inside everywhere except in lower portion of tube covered with little bristle-like processes becoming smaller towards the apex of the lobes, creamy-yellow marked with deep purplish-crimson concentric broken lines, narrowly margined on lobes with same color and a spot of same at the sinuses; *tube* broadly campanulate, about 7 mm. deep; *lobes* 6 mm. long, 7 mm. broad, slightly spreading, deltoid, acuminate, not ciliate;

Outer corona: very shortly 5-lobed, velvety purplish-crimson; lobes transversely oblong, emarginate;

Inner corona: lobes broad at the base, tapering to a subobtusate point, very minutely pubescent, connivent and rising slightly above the anthers, purplish with yellow knobs at the base;

Follicles: "in pairs, 2 to 5 in. long, approximate, erect, subparallel, narrow, compressed, acute or hooked at the apex, marked with interrupted purple lines; *seeds* ovate, glabrous, marginate, terminated by a setose pappus" (*Brown*).

Type locality: Ethiopia: Prov. of Shiré: Debra Sina.

Distribution: Also in Ethiopia: Prov. of Simen: Sabra; Shoata; Eritrea: Acrur; ? Anglo-Egyptian Sudan: Kassala Prov.: Sinkat; ? Anglo-Egyptian Sudan: Bahr-el-Ghazal Prov.: Jur-Land: Abu Gurun.

The name, *Stapelia* (*Huernia*) *macrocarpa*, was first bestowed in 1851 by A. Richard on an imperfectly described plant, which Quartin Dillon had discovered in Ethiopia in 1840. Richard's description only covered the stems and seed-pods of the plant, as shown above in the quotations from Dr. N. E. Brown's translation in the *Flora of Tropical Africa*. It was the great length of the seed-pods as compared with the height of the stems that determined Richard's name for the species, which means the "large-fruited *Huernia*."

In the Paris Herbarium there are specimens labeled *Stapelia macrocarpa*, collected by Schimper in Ethiopia, at Sabra in the Province of Simen, 5,000 feet elevation, and at Shoata, 6,000 to 7,000 feet. The proximity of these habitats to the home of Quartin Dillon's plant and the conformity of the stems to Richard's description substantiate the correctness of Schimper's diagnosis that his specimens actually belong to the *macrocarpa* of Richard. Characteristic of Schimper's specimens are the closely set concentric lines of the inner corolla surface.

The species was again collected by Prof. Schweinfurth among granite boulders at Acrur in Eritrea on April 8, 1892. And more recently our collaborator, Prof. Dr. Emilio Chiovenda, the greatest living authority on the botany of Somaliland, Eritrea and Ethiopia, has written us that the identity of Schweinfurth's plant with that described by Richard is incontestable.

This type form of *H. macrocarpa*, there-

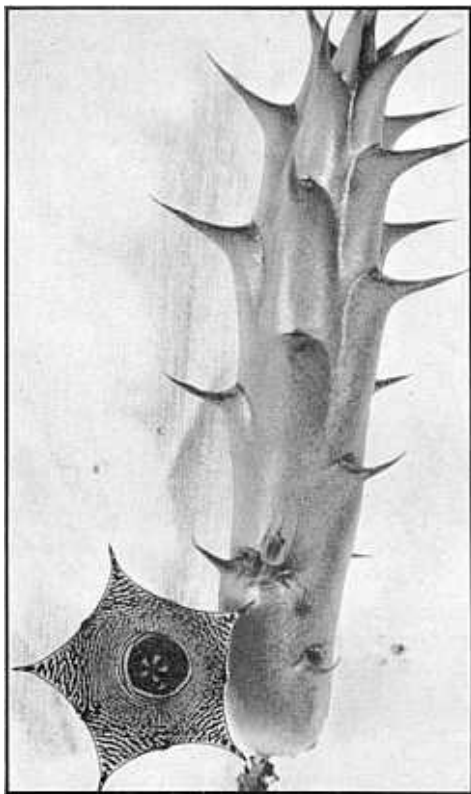


FIG. 868

Huernia macrocarpa Sprenger x 1.5

fore, may be accepted as the central unit in a series of varieties, two of them new, the others hitherto known as varietal forms of *H. penzigii*; while the latter name must itself be recombined as another variety. The following Key will indicate the relationship of the varieties to the type as well as to a secondary species, *H. concinna*:

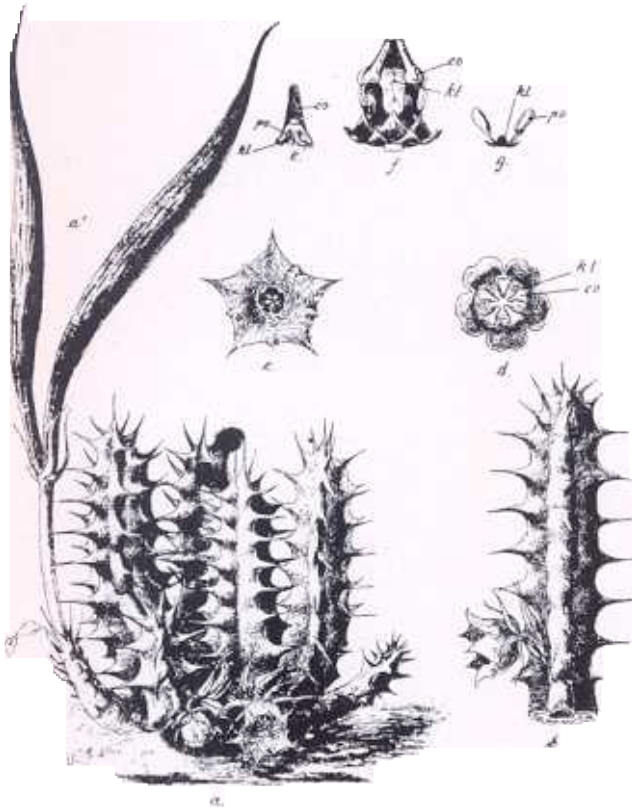


FIG. 869

Huernia macrocarpa Sprenger x 0.75

From a drawing by Zambony in Monatsschr. für Kakteenkunde, 1894.

A. Stems with 5 or more angles, erect:

I. Stems uniformly 5-angled; corolla with little bristle-like processes inside:

a. Corolla minutely papillate outside:

1. Corolla inside yellow, with concentric purple lines *H. macrocarpa*

2. Corolla inside uniformly dark reddish-brown:

i. Inner corona-lobes entirely maroon . . . (a) *H. macrocarpa* var. *schweinfurthii*

ii. Inner corona-lobes maroon and bright yellow (b) *H. macrocarpa* var. *flavicornata*

b. Corolla smooth outside:

1. Corolla inside yellow, with purple margins and spots *H. concinna*

II. Stems 5 to 7-angled, more robust than in (I); corolla with minute wart-like papillae inside and out:

a. Corolla uniformly dark purple (c) *H. macrocarpa* var. *penzigii*

b. Corolla uniformly cherry-red (d) *H. macrocarpa* var. *cerasina*

B. Stems 4-angled, procumbent to erect; corolla papillate-scabrous inside (e) *H. macrocarpa* var. *arabica*

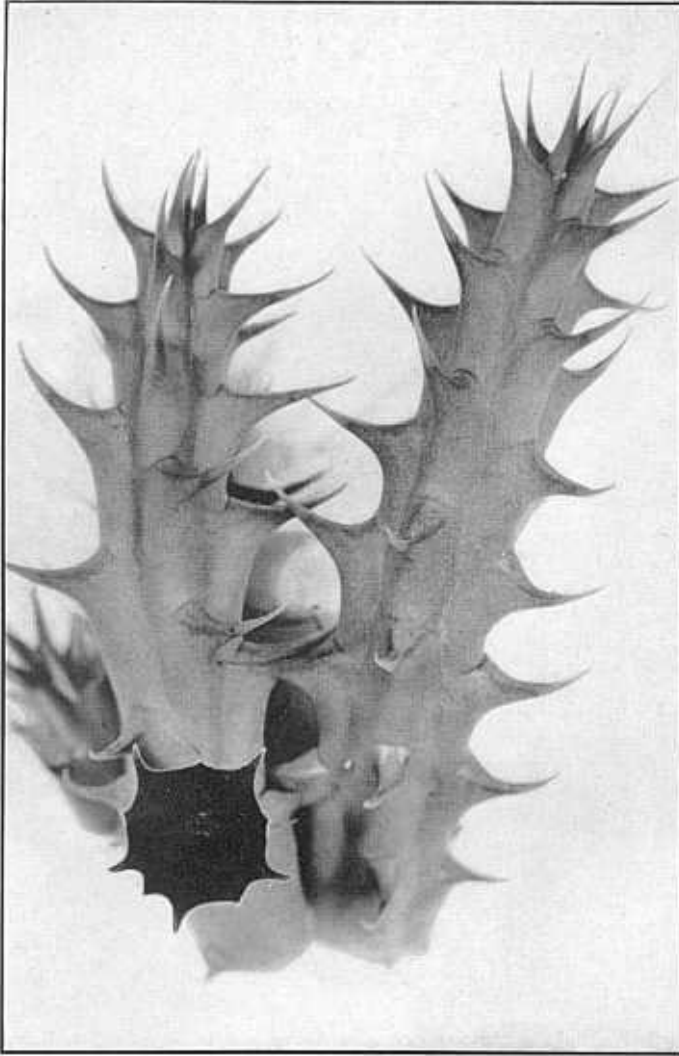


FIG. 870

Huernia macrocarpa var.
schweinfurthii, comb. nov.
x 1.

Var. a. *Huernia macrocarpa* var. *schweinfurthii* (Berger), comb. nov.

Huernia penzigii var. *schweinfurthii* Berger, Stap. und Klein., 142. 1910.

This variety grows together with the type at Acrur in Eritrea, among granite rocks at 6,000 feet elevation, and was noticed by Prof. Schweinfurth at the time he collected the type there. It is intermediate between the type and the var. *penzigii*, for it has the small uniformly 5-angled stems of the type, combined with the uniformly colored inner corolla surface of the var. *penzigii*. It is less hardy in cultivation than the var. *penzigii*.

The nearly related *Huernia macrocarpa*

var. *flavicornata*, var. nov., resembles the var. *schweinfurthii* in the appearance of its stems and in its uniformly dark reddish-brown inner corolla. But it differs in its corona. The outer corona-lobes are conspicuously longer than in the type or in any of the other varieties; while the inner corona-lobes have a bright yellow zone at the middle, which contrasts sharply with the wholly maroon inner corona-lobes of the var. *schweinfurthii*. This yellow accent can be recognized even in a photograph.

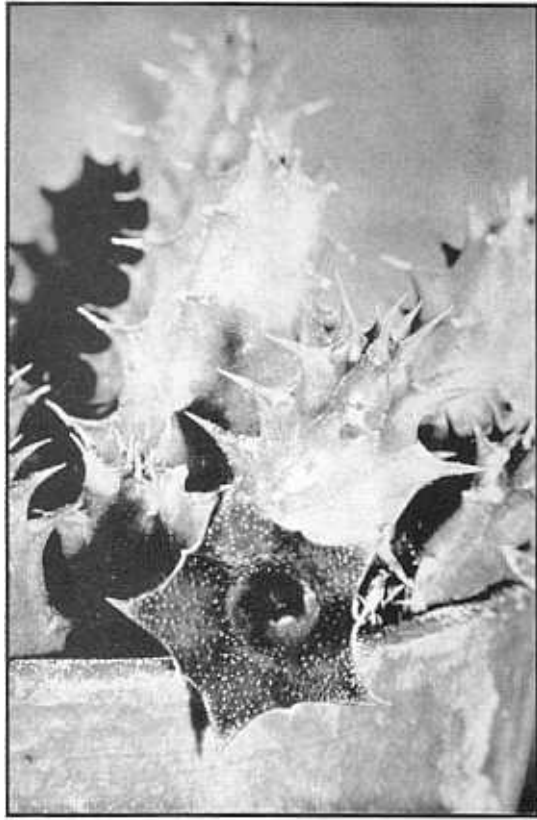


FIG. 871

Huernia macrocarpa var. *cerasina*,
var. nov. x 1.25

Var. c. *Huernia macrocarpa* var. *penzigii* (N. E. Brown), comb. nov.

Stapelia macrocarpa Martelli, Florula Bogos, 56. 1886. *Nec* A. Richard, 1851.

Huernia penzigii N. E. Brown, Gard. Chron., xi. 719. 1892.

Huernia macrocarpa Berger *nec* Sprenger, in *syn.*, Stap. und Klein., 140. 1910.

(Description by Dr. Brown, Flora Trop. Afr., iv. i. 496):

Stems: erect, 2 to 3 in. high, 6 to 8 lin. thick excluding the teeth, 5 (to 7, W. & S.)-angled, glabrous; angles with stout conical straight spreading teeth 4 to 5 lin. long, ending in fine subulate points;

Flowers: 1 to 5 in a fascicle at the base of the young stems, developing successively;

Pedicel: $\frac{1}{4}$ in. long, glabrous;

Sepals: 4 to 6 lin. long, lanceolate-subulate, spreading, glabrous;

Corolla: campanulate, about $\frac{1}{2}$ in. long and $\frac{3}{4}$ in. in expanse; rough outside and inside with minute wart-like papillae, which are inconspicuous in the dried state, otherwise glabrous, not ciliate, entirely blackish-purple within; *lobes* about $\frac{1}{4}$ in. long, deltoid, slightly spreading;

Outer corona: of 5 transversely oblong, obtuse or emarginate lobes, $\frac{1}{3}$ lin. long, purple-black;

Inner corona: lobes $\frac{3}{4}$ lin. long, incurved over the backs of the anthers, then erect, deltoid-subulate, with a transverse ridge behind at their base, glabrous, blackish-purple.

Type locality: Eritrea: among rocks on Mount Sevan, near Keren.

Distribution: Also in Eritrea: near Geleb; and on Deban Mountain; ? Ethiopia.

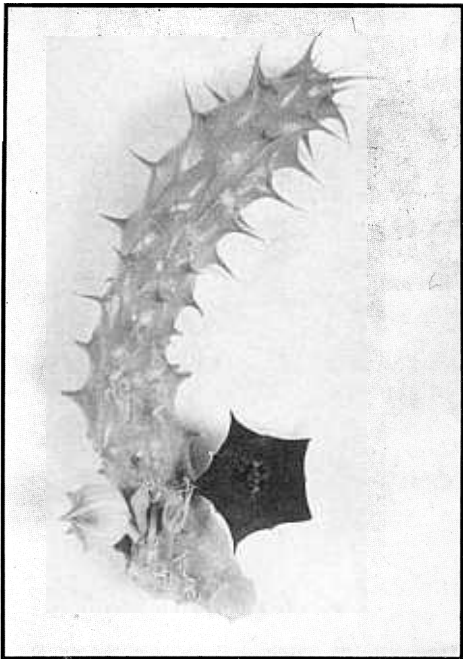


FIG. 872
Huernia macrocarpa var. *penzigii*,
comb. nov. x 1.

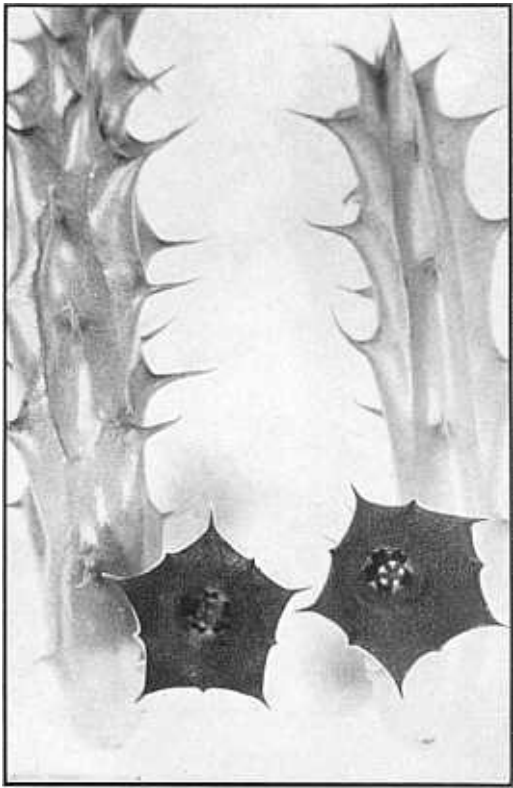


FIG. 873
Huernia macrocarpa var. *penzigii* (left) and
var. *flavicoronata* (right) x 1.5



FIG. 874
Huernia macrocarpa var. *cerasina*, var. nov. x 1
Photo by F. Wiedemann.

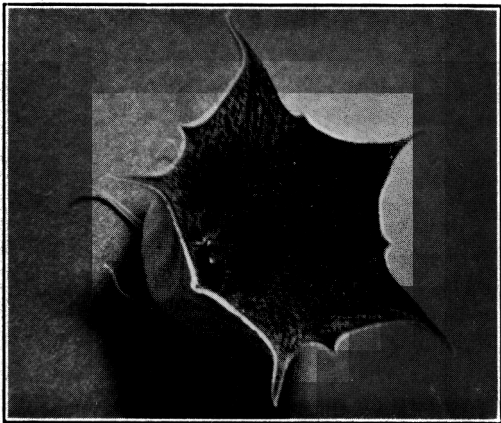


FIG. 875
Huernia macrocarpa var. *penzigi*,
comb. nov. x 3.
Photo by James West.

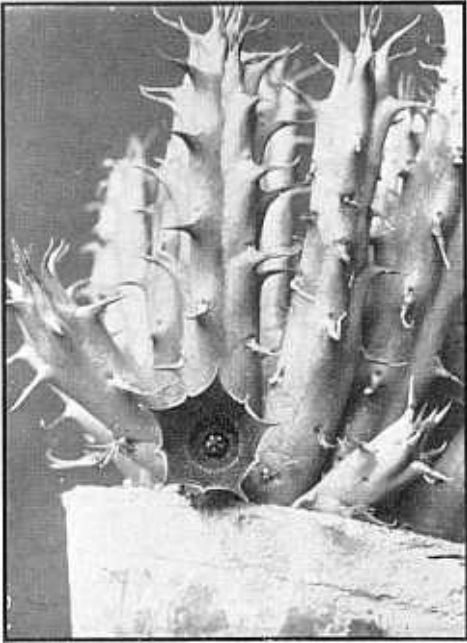


FIG. 876

Huernia macrocarpa var. *flavicoronata*,
var. nov. x 0.75

Photo by F. Wiedemann.

"Penzig's variety," discovered by Prof. Otto Penzig on his expedition to Eritrea with Schweinfurth in 1891, is the most frequent member of the *macrocarpa* group in cultivation. The flowers, uniformly deep purple within, blossom generously on a mature plant, and when grown under glass will appear almost every month of the year. There is another variety (*Huernia macrocarpa* var. *cerasina*, var. nov.) in which the corolla is a conspicuous cherry-red. Both the vars. *penzigii* and *cerasina* have the outer corona-lobes longer and usually more prominently notched or emarginate at the apex than those of the type and the var. *schweinfurthii*, but shorter than those of the var. *flavicoronata*. The stout stems of the vars. *penzigii* and *cerasina*, literally armed to the teeth, recall the name given in Japan to all plants of the genus *Huernia*, "King of the Dragons." They can be distinguished from all other *macrocarpas* by their greater size and by their 5 to 7 angles. In cultivation the stems of the var. *penzigii*



FIG. 877. Unusual branching of *Huernia macrocarpa* var. *penzigii*, comb. nov.



FIG. 878

Huernia macrocarpa Sprenger x 0.5

Perhaps one of the varieties, but the identification is uncertain. Note the very light color at the base of the tube. Photo by A. Probst and E. R. Svensson.

grow much longer than those developed in the wild state, and when freely watered they branch and branch again, forming thickets of extraordinary aspect. See Fig. 877.

Our plants of the vars. *cerasina* and *flavirocoronata* were grown from seed collected in Eritrea, and doubtless represent natural hybrid forms of the type.

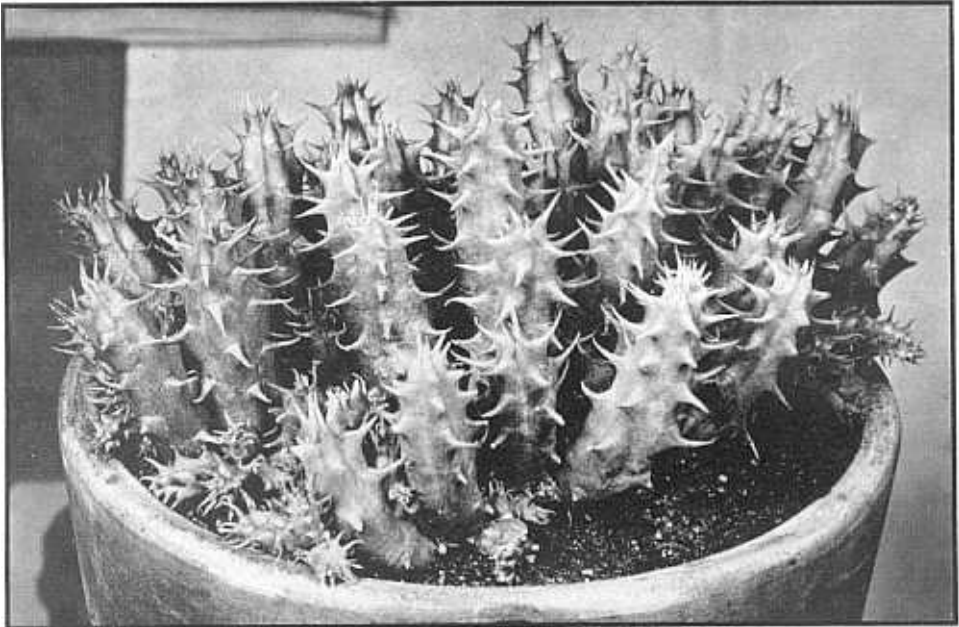


FIG. 879

Stems of *Huernia macrocarpa* var. *schweinfurthii*, comb. nov. x 0.8

Var. e. ***Huernia macrocarpa* var. *arabica*** (N. E. Brown), comb. nov.

Huernia arabica N. E. Brown, Kew Bull., 265. 1895.

Huernia penzigii var. *arabica* Berger, Stap. und Klein., 143. 1910.

(Description by Dr. Brown, l.c., translated from the Latin):

Stems: 2 to 3½ in. long, probably 5 to 6 lin. thick, glabrous, 4-angled; angles with subulate teeth;

Pedicel: 3 lin. long, glabrous;

Sepals: 4 lin. long, attenuate, subulate, glabrous;

Corolla: about 7 lin. in diameter, campanulate, papillate-scabrous within; *lobes* 3 lin. long, deltoid, acuminate;

Outer corona: lobes ½ lin. long, ⅔ lin. broad, quadrate, truncate;

Inner corona: lobes ⅔ lin. long, gradually narrowing from the base, almost twice as long as the anthers.

Type locality: Southern Arabia: Hille: Gebel Bura.

Distribution: Also from Walledjeh: Gebel Melhan.

This is the only *Huernia* found outside of the African continent. It was collected by Prof. Schweinfurth on Jan. 3, 1889, in Southern Arabia. It appears to differ from the type mainly in the 4-angled (?) stems,

which are procumbent to erect and more slender than in the type, with strong spreading teeth. The color of the flowers is not stated.

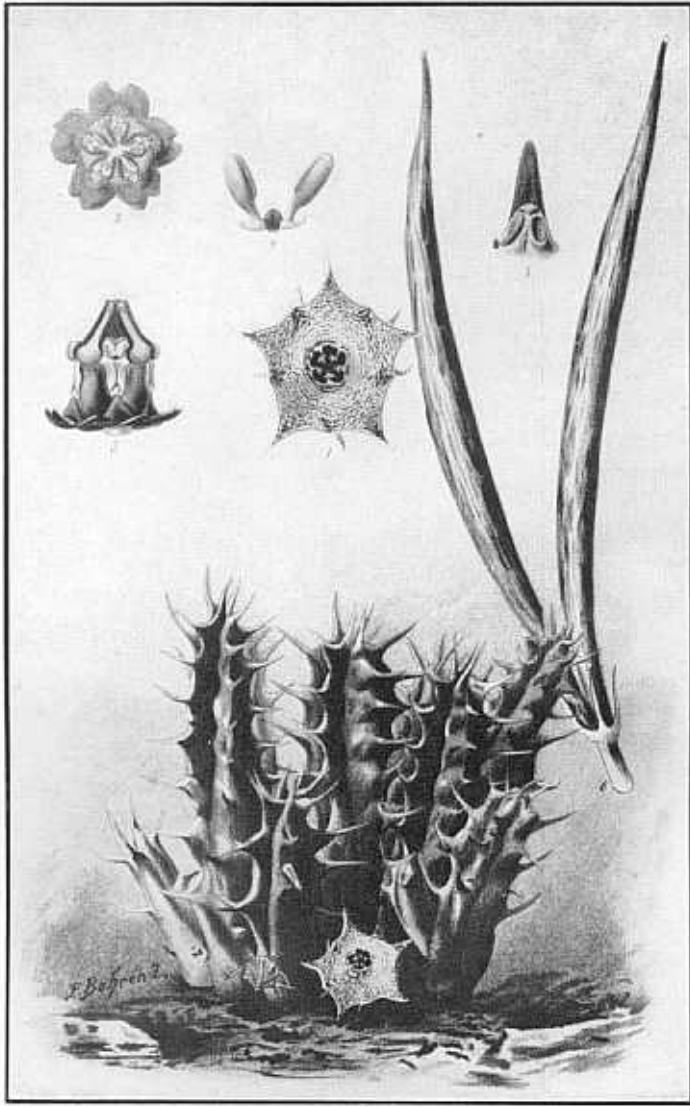


FIG. 880

Huernia concinna N. E. Brown x 0.9

Drawing by F. Behrend in *Gartenflora*, 1895.

9. *Huernia concinna* N. E. Brown, *Flora Trop. Afr.*, iv. i. 497. 1904.

Huernia macrocarpa Taubert, *Gartenfl.*, 353. 1895. *Nec Sprenger*, 1894.

(Description by Dr. Brown, l.c.):

Stems: tufted, 1 to 1½ in. long, 4½ to 5 lin. thick exclusive of the teeth, decumbent, 5-angled, glabrous, light green, scarcely glaucous; angles toothed; teeth 3 to 3½ lin. long, straight, spreading, subulate from a stout conical base, without lateral teeth;

Flowers: 1 to 2 (or more?) fascicled on the basal part of the young stems;

*Pedice*l: 2½ lin. long, glabrous;

Sepals: 4 lin. long, ⅔ lin. broad at the base, gradually tapering to very fine hair-like points, glabrous;

Corolla: about 1 in. in diameter; outside glabrous, smooth, whitish; inside everywhere covered with little bristle-like processes, pale sulphur-yellow, marked all over with small dark brownish-crimson spots, narrowly margined with dark purple-brown on the lobes, not ciliate; *tube* about 3 lin. long and 7 lin. in diameter, broadly campanulate; *lobes* 4 lin. long, $4\frac{1}{2}$ lin. broad, slightly spreading, deltoid, acuminate;

Outer corona: very shortly 5-lobed, rich velvety purple-brown; lobes $\frac{1}{4}$ lin. long, $\frac{2}{3}$ to $\frac{3}{4}$ lin. broad, transversely oblong, emarginate;

Inner corona: lobes $\frac{1}{2}$ lin. long, $\frac{1}{3}$ lin. broad at the base, gradually tapering to a subobtusate point, connivent in a cone over the tips of the anthers, yellow, margined and speckled with purple-brown.

Type locality: Eritrea: without precise locality.

Distribution: Also in Somaliland: without precise locality.

The story of the "beautiful *Huernia*" is a strange one. When Schweinfurth returned from Eritrea in 1892, he visited the botanist, Dr. P. Taubert, and casually gave him a *Stapeliad* stem, which he had found at the bottom of his summer overcoat pocket. Both men assumed that this stem represented *Huernia macrocarpa*, a plant Schweinfurth had collected at Acrur. Dr. Taubert nursed the little stem with devotion. By August, 1893, it had grown into a hardy plant of 11 stems, upon which flowers soon began to appear. In 1895 Taubert published an account of the plant, which he still believed to represent *H. macrocarpa*. Yet in several respects there proved to be differences. The stems were identical; but the corolla, instead of being marked with concentric lines only, was marked with fine spots of dark brownish-crimson on a sulphur-yellow ground and margined with a band of dark purple-brown. Unlike the roughly papillate outer surface of *H. macrocarpa*, the outside surface of the corolla was quite smooth. In 1896 the same plant was collected in Somaliland by Mrs. Lort-Phillips and Sir Edmond Loder and sent to the Cambridge Botanic Gardens. The fact that Schweinfurth believed that he had collected the plant in the same locality as *H. macrocarpa*

and the identity of the stems, which led Dr. Taubert to assume that the plant really was *H. macrocarpa*, suggest at most a varietal separation from that species; but Dr. N. E. Brown considered the marking of the corolla and the absence of papillae sufficiently distinct characters to warrant the creation of a new species.

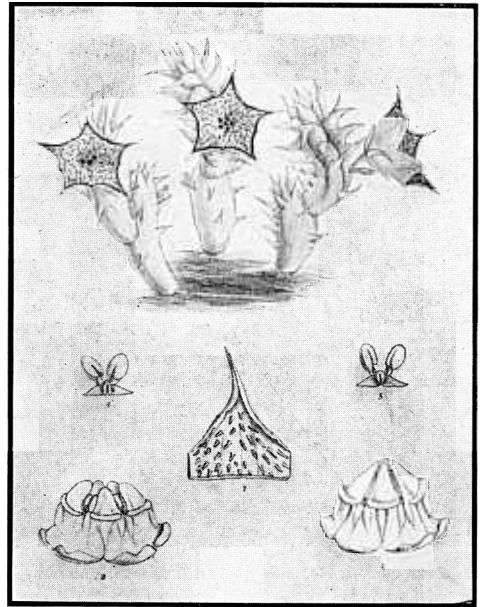


FIG. 881

Huernia concinna N. E. Brown x 0.75

From a drawing by Miss Matilda Smith, in Curtis's Botanical Magazine, 1903.

10. *Huernia brevirostris* N. E. Brown, Gard. Chron., vii. 780. 1877.

(Description by Dr. Brown, Flora Cap., iv. i. 915):

Stems: crowded, erect or ascending, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, $\frac{1}{2}$ to 1 in. thick, acutely 4 to 5-angled, glabrous, glaucous-green, becoming dull-green or purplish with age; teeth of the angles 1 to $1\frac{1}{2}$ lin. long, deltoid, acute;

Flowers: 3 to 6 in a fascicle, near the base of the young stems, successively developed;

*Pedice*l: $\frac{1}{3}$ to 1 in. long, 1 lin. thick, often reddish-tinted, slightly glaucous;

Sepals: $1\frac{1}{2}$ to $2\frac{1}{2}$ lin. long, lanceolate-subulate, glabrous;

Corolla: shortly and acutely pointed in bud; when expanded 1 to $1\frac{1}{4}$ in. in diameter; *tube* short, globose-campanulate, about $\frac{1}{4}$ in. long and 5 lin. in diameter outside, slightly constricted at (but not raised into a ring around) the mouth; *lobes* abruptly horizontally spreading and often recurved, $\frac{1}{3}$ in. long, $\frac{1}{2}$ in. broad at the base, deltoid, very acute; outside smooth, glabrous and often reddish-tinted or dotted with purple; inner face rough with numerous papillae on the lobes and in the throat of the tube, where they are generally tipped with (but sometimes entirely without) a minute hair, pale yellow on the lobes, pinkish-white in the tube, evenly dotted in variable density with crimson except at the bottom of the tube, which is entirely crimson and very shining, sometimes with crimson or purplish tips to the lobes;

Outer corona: black, subequally 10-toothed or with 5 deeply bifid lobes $\frac{2}{3}$ lin. long, with deltoid-oblong obtuse teeth;

Inner corona: lobes about 1 lin. long, subulate, with a transverse hump on the back at the base, incumbent upon the anthers and prolonged scarcely $\frac{1}{2}$ lin. beyond them into connivent-erect tips, purple-brown or the upper part dull yellowish speckled with purple-brown.

Type locality: Cape Prov.: Graaff Reinet Distr.: dry rocky hills of Rynevelds Pass, near Graaff Reinet, at 2700 ft. elevation.

Distribution: Also in Swellendam Distr.: Barrydale; Cradock Distr.: Halesowen.

The "short-beaked *Huernia*" received its name from the very short tips of the inner corona-lobes in the type specimen. It was discovered by Harry Bolus about 1874 and sent by him to the Royal Botanic Gardens at Kew. It is an extremely variable species, as a glance at the accompanying photo-

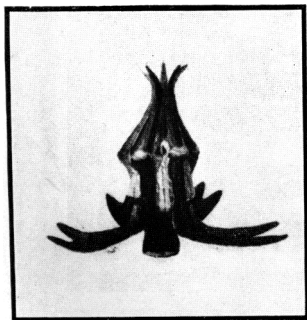


FIG. 882

Corona of *Huernia brevirostris* N. Brown
Drawing by Carl Luckhoff.

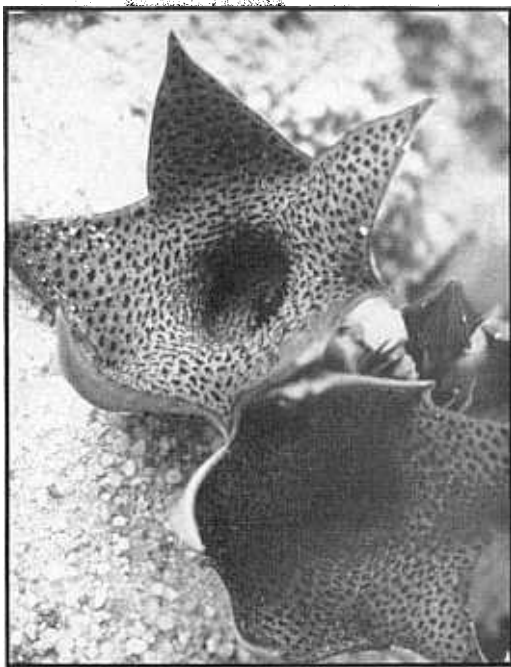


FIG. 883

Huernia brevirostris N. E. Brown x 2.
Photo by Carl Luckhoff.

graphs by C. Luckhoff and others will reveal. Heretofore the forms growing be-

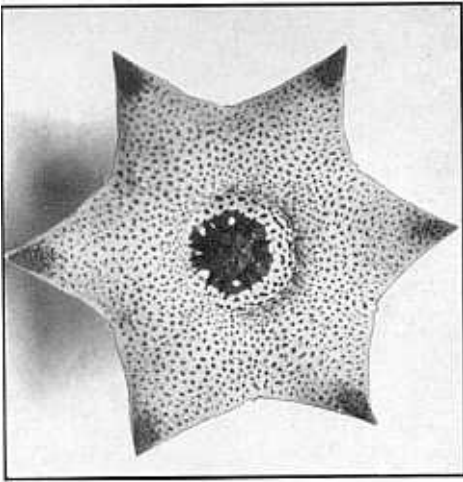


FIG. 884

A six-lobed flower of *Huernia brevirostris*
N. E. Brown x 1.6

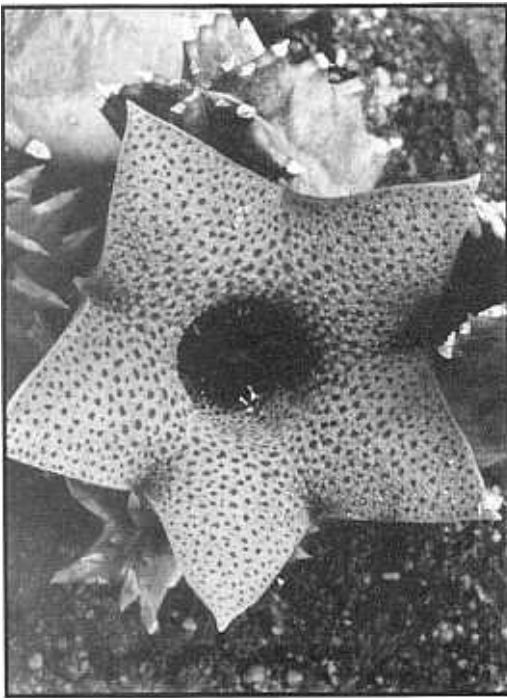


FIG. 885

Huernia brevirostris N. E. Brown, form
related to the type x 2.

Photo by Carl Luckhoff.

tween Graaff Reinets and Kendrew have been grouped together as varieties of *H. brevirostris*, whilst those growing further west, from Biesjes Poort to Rhenoster Kop, have been considered as varieties of a second species (*H. scabra*). All these forms, however, blend into one another too closely for both species to be maintained any longer. We therefore now combine them, and what we present as varieties are simply the old names, plus two new ones, designed to offer tentative pigeon-holes for the codification of the existing material, until such time as a more complete study is possible. The main features of the *H. brevirostris* group, taken as a whole, are a rather waxy inner corolla surface, rough with papillae alike in the tube and on the widely flaring lobes, the papillae usually tipped with a small hair or bristle; a corona pattern with deeply bifid outer corona-lobes, dark purple in color and often velvety in texture; and

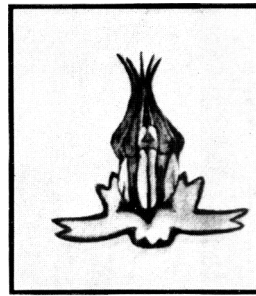


FIG. 886

Corona of the flower shown in Fig. 885

Drawing by Carl Luckhoff.

a cluster of inner corona-lobes incumbent on the anthers and then somewhat (sometimes, in contradiction of the specific name, very much) produced above them. On this simple theme, natural causes which we cannot hope to fathom have orchestrated an amazingly rich chorus of beautiful variations. Sometimes the corolla is wholly primrose-yellow, without spots at all (var. *immaculata*); sometimes a large galaxy of minute dots are found (var. *parvipuncta*); sometimes the spots become very promi-

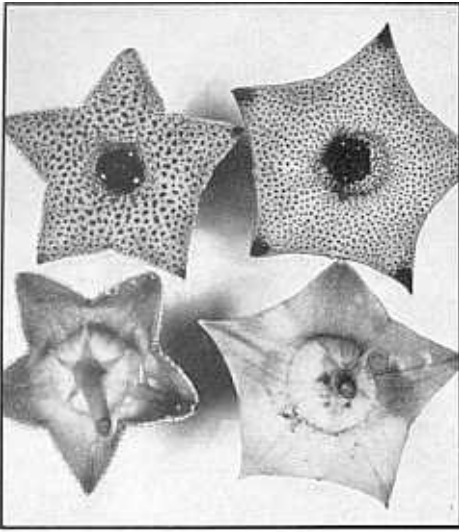


FIG. 887

Huernia brevirostris N. E. Brown x 1.
Showing variations in size of markings, etc.

nent, as in the type; and in rare flowers they are confluent at the tips of the lobes into

conspicuous uniformly colored patches. Again the corolla may have a distinct annulus (var. *scabra*); or there may be only a slight convex swelling of the inner surface (var. *longula*); or there may be no trace of any annulus at all (var. *intermedia*). The outer corona may be wholly dark purple as in the type; or much paler with only the margin in dark purple (var. *scabra*). Or finally the inner corona-lobes may hardly be prolonged above the anthers at all (var. *ecornuta*); or they may rise quite to the level of the mouth of the corolla-tube (var. *longula*); indeed the length of the inner corona-lobes varies materially sometimes even in different flowers from a single plant. The permutations possible on these gradual changes in details are bewildering, but they are always beautiful and they promise to furnish interesting material for study for many years before a definitive classification can be attained.

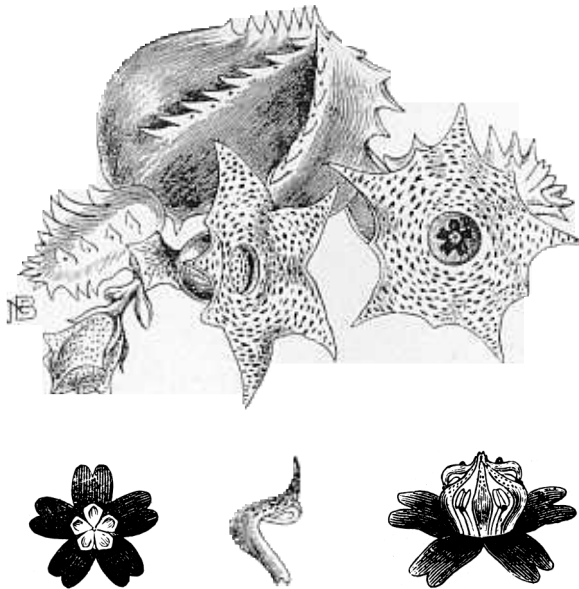


FIG. 888

Huernia brevirostris N. E. Brown x 1.
Drawing by N. E. Brown in *Gardeners' Chronicle*, 1908.

KEY TO THE VARIETIES OF *HUERNIA BREVIROSTRIS*

- A. Inner corona-lobes more or less produced above the anthers, but not nearly to the level of the mouth of the tube:
 - I. Corolla not or inconspicuously raised into an annulus around the tube:
 - a. Corolla marked with largish spots, thickly sprinkled *H. brevirostris*
 - b. Corolla marked with largish spots, thinly sprinkled (a) var. *histrionica*
 - c. Corolla marked with small faint spots (b) var. *pallida*
 - d. Corolla marked with minute dots throughout corolla surface (c) var. *parvipuncta*
 - e. Corolla marked with minute dots on tips of papillae only (d) var. *intermedia*
 - f. Corolla not marked with any spots or dots (e) var. *immaculata*
 - II. Corolla conspicuously raised into an annulus around the tube (f) var. *scabra*
- B. Inner corona-lobes produced above the anthers nearly to the level of the mouth of the tube (g) var. *longula*
- C. Inner corona-lobes not produced above the anthers (h) var. *ecornuta*

Var. a. *Huernia brevirostris* var. *histrionica*, var. nov

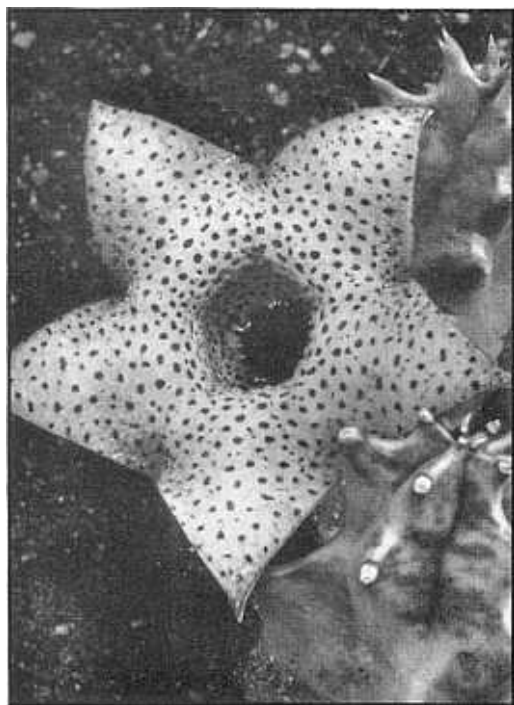


FIG. 889

Huernia brevirostris var. *histrionica*, var. nov
Photo by Carl Luckhoff.

The flowers of the "variety in motley" wear a gay corolla of large purple spots on sulphur-yellow ground suggestive of Harlequin or Columbine. The spots are much more scattered than in the type. The length of the portion of the inner corona-lobes produced above the anthers is especially variable, even in different flowers on the same plant. This variety was discovered by Dr. Luckhoff and his son, Carl Luckhoff, on the road between Graaff Reinet and Kendrew in November, 1931.

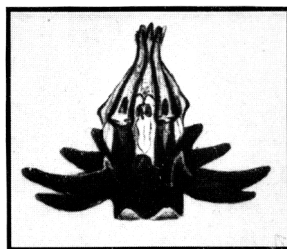


FIG. 890

Corona of *Huernia brevirostris*
var. *histrionica*, var. nov.
Drawing by Carl Luckhoff.

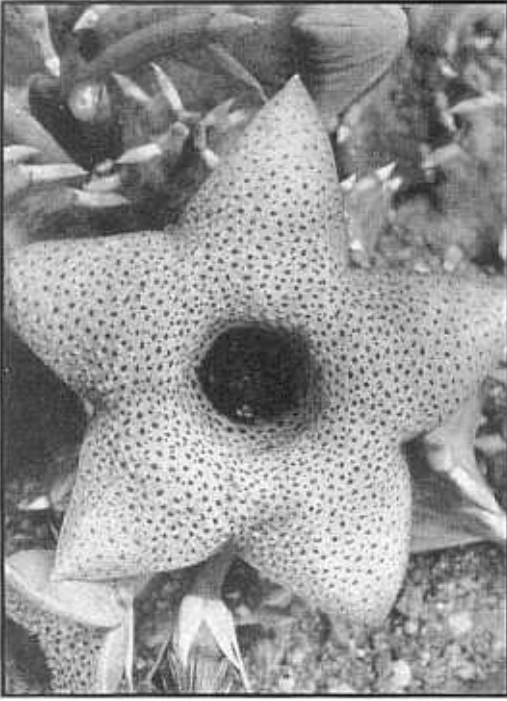


FIG. 891

Huernia brevirostris N. E. Brown, form related to the var. *bistrionica* x 2.

Photo by Carl Luckhoff.

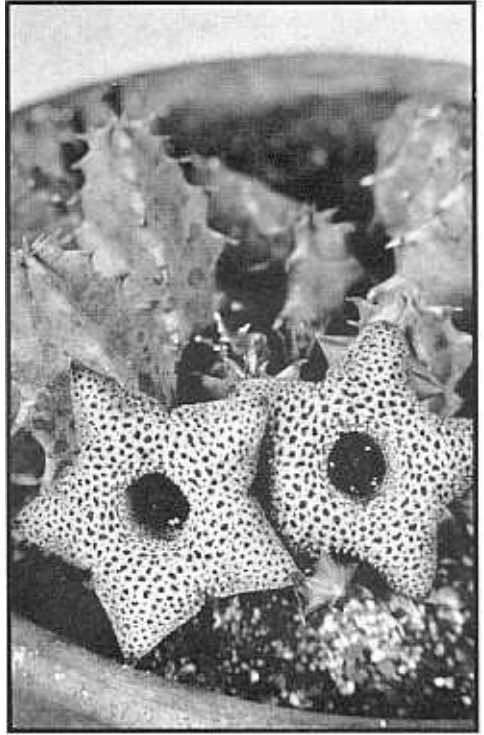


FIG. 892

Huernia brevirostris, form related to the var. *bistrionica* x 1.

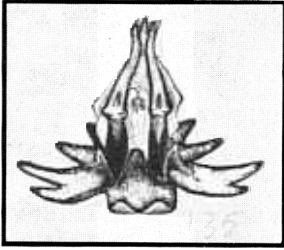


FIG. 893

Corona of the flower shown in Fig. 891

Drawing by Carl Luckhoff.

Var. b. *Huernia brevirostris* var. *pallida* (N. E. Brown), comb. nov.

Huernia scabra var. *pallida* N. E. Brown, Flora Cap., iv. i. 916. 1909.

(Description by Dr. Brown, l.c.):

Corolla: about $1\frac{1}{3}$ in. in diameter, not or inconspicuously raised into a convex ring around the mouth of the tube, pale primrose-yellow, with light purple markings, smaller and fainter than the var. *scabra*, and the surface much less scabrous, with small slightly prominent papillae, those in the throat being tipped with minute acute dark purple hairs;

Outer corona: disk and lobes dark purple-brown, with 5 slight ridges on the disk radiating from the base of the inner corona and ending in slight projections between the lobes;

Otherwise as in the var. *scabra*.

Type locality: Cape Prov.: Victoria West Distr.: Biesjes Poort.

Distribution: Not further known.

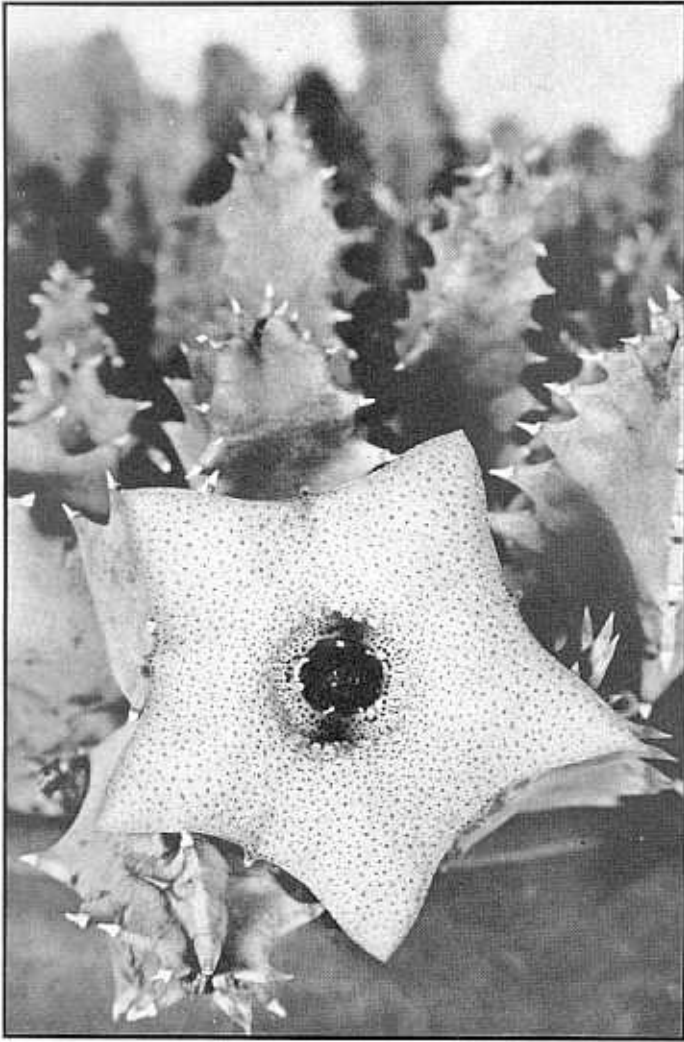


FIG. 894

Huernia brevirostris N. E. Brown x 2.
Form related to the var. *parvipuncta*.

Var. c. *Huernia brevirostris* var. *parvipuncta*, var. nov.

This "small-dotted variety" was discovered by Dr. J. Luckhoff and his son, C. Luckhoff, in the Graaff Reinnet district, between Graaff Reinnet and Kendrew, and the type plant is No. 120 in the Luckhoff herbarium. The markings on the corolla face

are very small, but not restricted to the tips of the papillae, as in the var. *intermedia*. The outer corona is wholly dark purple, and the inner corona-lobes are produced far above the anthers, becoming somewhat diverging at the apex.

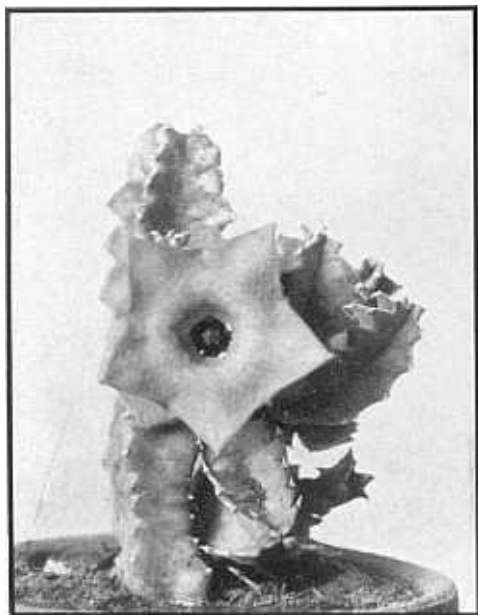


FIG. 895
Huernia brevirostris var. *intermedia*
N. E. Brown x 1.
From W. I. Beecroft Gardens. Photo by Havens.
The identification is uncertain.

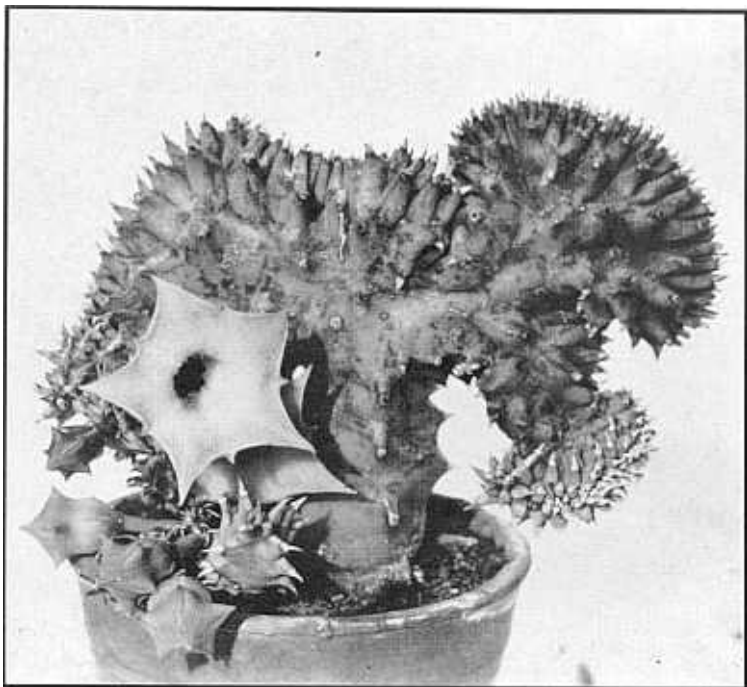


FIG. 896
Huernia brevirostris var.
immaculata, comb. nov.
x 0.75
Photo of a crested plant by
A. Probst and E. R.
Svensson.

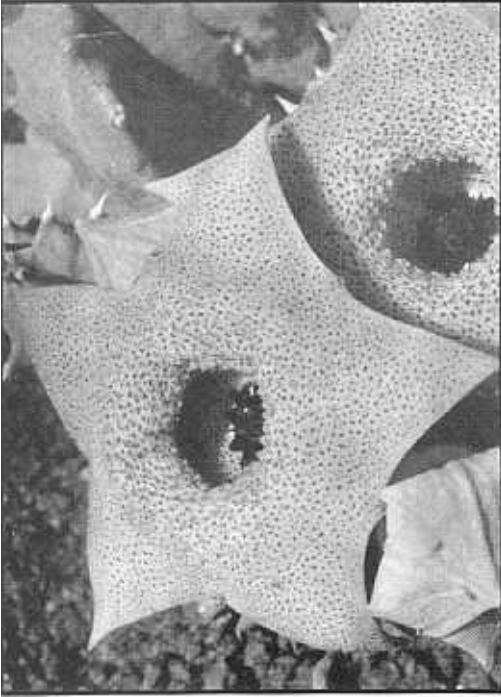


FIG. 897

Huernia brevirostris var. *parvipuncta*,
var. nov. x 2.

Photo by Carl Luckhoff.

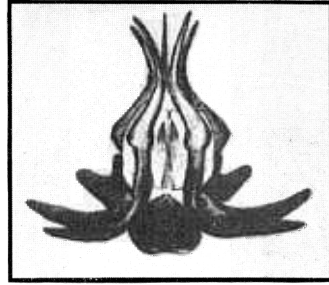


FIG. 898

Corona of *Huernia brevirostris*
var. *parvipuncta*, var. nov.

Drawing by Carl Luckhoff.

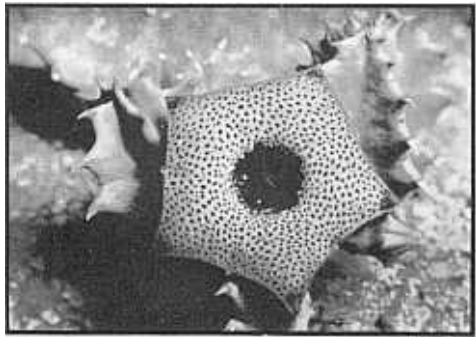


FIG. 899

Huernia brevirostris, form related to the
var. *parvipuncta* x 1.

Var. d. *Huernia brevirostris* var. *intermedia* N. E. Brown, *Flora Cap.*, iv. i. 915.
1909.

(Description by Dr. Brown, l.c.):

Corolla: rugose with small conical papillae within, except on the lower part of the tube, primrose-yellow with a minute purple dot at the tip of each papilla; inside of the tube paler, with a light purple area at the base around the outer corona.

Type locality: Cape Prov.: Graaff Reinet Distr.: near Graaff Reinet.

Distribution: Not further known.

The "intermediate variety" was first collected by Mr. Pillans. According to Dr. Brown it is intermediate between *H. brevirostris* and *H. primulina*, but is readily distinguished by the purple area at the base of the distinctly larger corolla-tube, which is

absent in *H. primulina*. The minute purple dots on the tips of the papillae are also characteristic, and form the first step in the gradual development of spots from the wholly spotless corolla of the var. *immaculata* to the more heavily marked varieties.

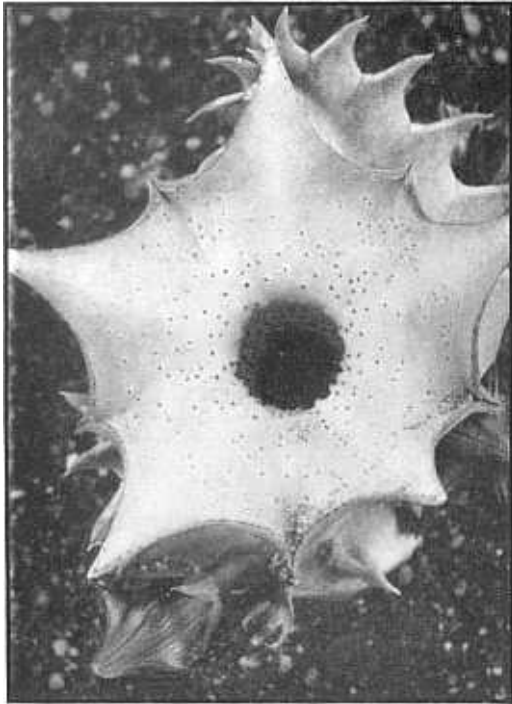


FIG. 900
Huernia brevirostris N. E. Brown, form related
to the var. *immaculata* x 2.
Photo by Carl Luckhoff.

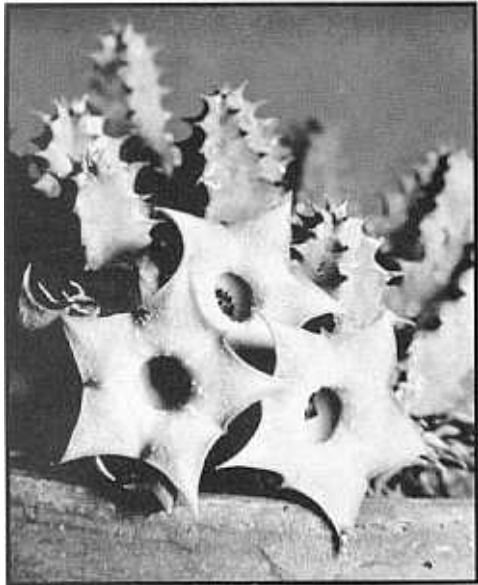


FIG. 903
Huernia brevirostris var. *immaculata*,
comb. nov. x 0.75

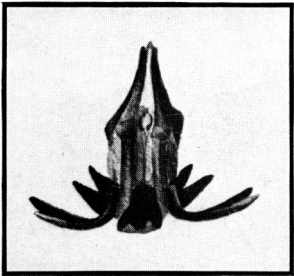


FIG. 901. Corona of the flower shown in Fig. 900
Drawing by Carl Luckhoff.

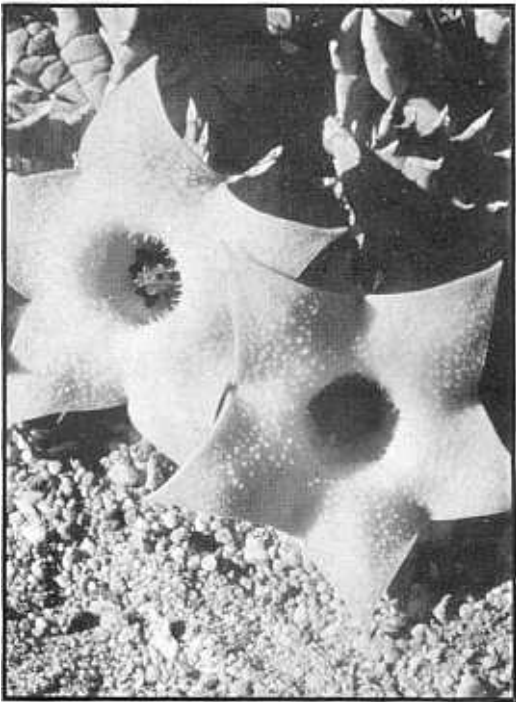


FIG. 902. *Huernia brevirostris* var. *immaculata*,
comb. nov. x 1.4
Photo by Carl Luckhoff.

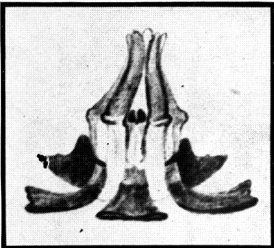


FIG. 904. Corona of *Huernia brevirostris*
var. *immaculata*, comb. nov.
Drawing by Carl Luckhoff.

Var. e. *Huernia brevirostris* var. *immaculata* (N. E. Brown), comb. nov.

Huernia scabra var. *immaculata* N. E. Brown, Flora Cap., iv. i. 916. 1909.

(Description by Dr. Brown, l.c.):

Corolla: $1\frac{1}{2}$ to $1\frac{3}{4}$ in. in diameter, scarcely or inconspicuously raised into a convex ring around the mouth of the tube, primrose-yellow, without spots, tinged with very pale purple at the base of the tube around the corona, scabrous with the papillae at the mouth and in the throat of the tube tipped with short acute pinkish hairs;

Inner corona: lobes overtopping the anthers, about 1 lin. long, slightly gibbous behind.

Type locality: Cape Prov.: Victoria West Distr.: Biesjes Poort.

Distribution: Also from Graaff Reinet Distr.: between Graaff Reinet and Kendrew; Cradock Distr.: Halesowen.

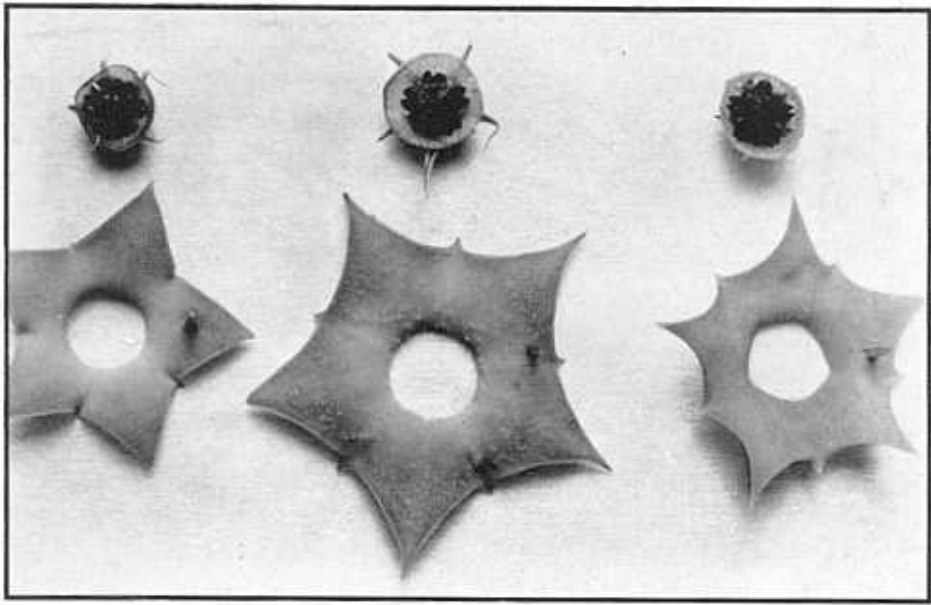


FIG. 905

Showing relationship of *Huernia brevirostris* var. *immaculata* (centre) to *H. primulina* (left and right).

An interesting variety, wholly without purple spots on the corolla face. The flowers can easily be confused with those of *H. primulina* var. *rugosa*. They are

larger, however, and their hair-tipped papillae contrast on a close comparison with the hairless tubercles of *H. primulina* var. *rugosa*.

Huernia brevirostris

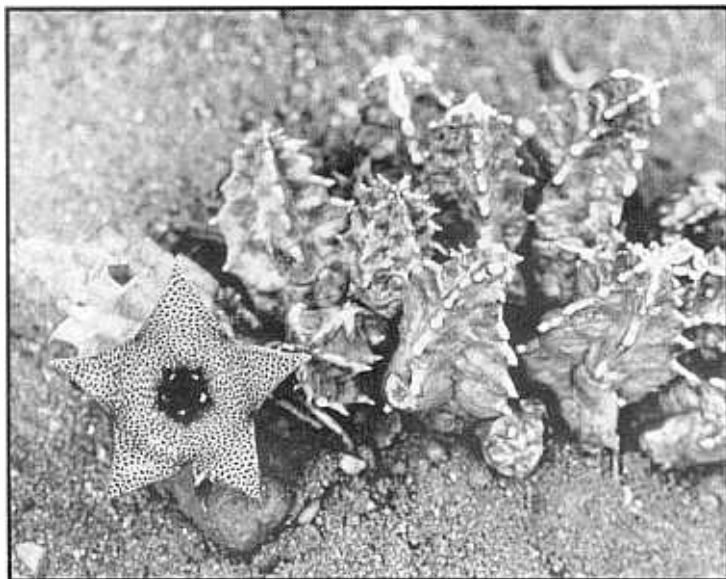


FIG. 906

Huernia brevirostris var. *scabra*, comb. nov. x 0.8

Photo: G. W. Reynolds, Johannesburg.

Var. f. ***Huernia brevirostris* var. *scabra*** (N. E. Brown), comb. nov.

Huernia scabra N. E. Brown, Flora Cap., iv. i. 916. 1909.

(Description by Dr. Brown, l.c.):

Stems: compactly erect, 1 to $1\frac{3}{4}$ in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. thick, sharply 4 to 5 (rarely 6)-angled, with compressed deltoid teeth $1\frac{1}{2}$ to 2 lin. long, glabrous, dull green or greyish-green, sometimes mottled with dull purple;

Flowers: in cymes of 3 to 5 near the base of the stems, successively developed;

*Pedice*l: about 4 lin. long, 1 lin. thick, glabrous;

Sepals: 2 to $2\frac{1}{2}$ lin. long, lanceolate, acuminate, glabrous;

Corolla: $1\frac{1}{2}$ to $1\frac{2}{3}$ in. in diameter; *tube* 4 lin. long and 5 lin. in diameter outside at the top, not wider at the mouth than below; *limb* spreading horizontally from the tube and raised around its mouth into a conspicuous broad convex ring, scabrous with rather stout conical acute papillae, which, at the mouth and throat of the tube, are tipped with a short stiff acute dark purple hair; *lobes* somewhat spreading and recurving, about 5 lin. long and 7 to 8 lin. broad at the base, deltoid, very acute, with a minutely papillate inner surface; outside smooth, dotted with pale purple on a pale (flesh colored?) ground; inside with the ground color varying from pale flesh-tinted to light canary-yellow, covered on the lobes and ring with round light purple (or crimson?) spots, which pass into transverse broken lines within the tube, which at the base, around the outer corona, is entirely purple;

Outer corona: of 5 pairs of acute deltoid teeth or of 5 deeply and acutely bifid lobes $\frac{2}{3}$ to $\frac{3}{4}$ lin. long, dark purple-brown, all united at their base into a circular disk of a pale pinkish tint, margined with purple-brown between the lobes;

Inner corona: lobes much overtopping the anthers, $1\frac{3}{4}$ lin. long, not reaching to the mouth of the tube, subulate, obtuse, with a transverse ridge at their base, connivent at the middle, slightly spreading at the upper half, pale purple.

Type locality: Cape Prov.: Victoria West Distr.: Biesjes Poort.

Distribution: Also in Cradock Distr.: common at many points; ?Caledon Distr. Touws River.

We have quoted in full Dr. Brown's description of the "scabrous variety," heretofore considered as a distinct species, so that the many points of similarity to the type may be noticed. The principal difference lies in the conspicuous convex annulus on the corolla, which is very different from anything present in the type; but the remaining varieties furnish so many gradations between the full annulus and no annulus at all that the plant cannot be kept specifically distinct on this account.

FIG. 907

Huernia brevirostris var. *scabra*,
comb. nov. x 0.7

Photo by Carl Luckhoff.

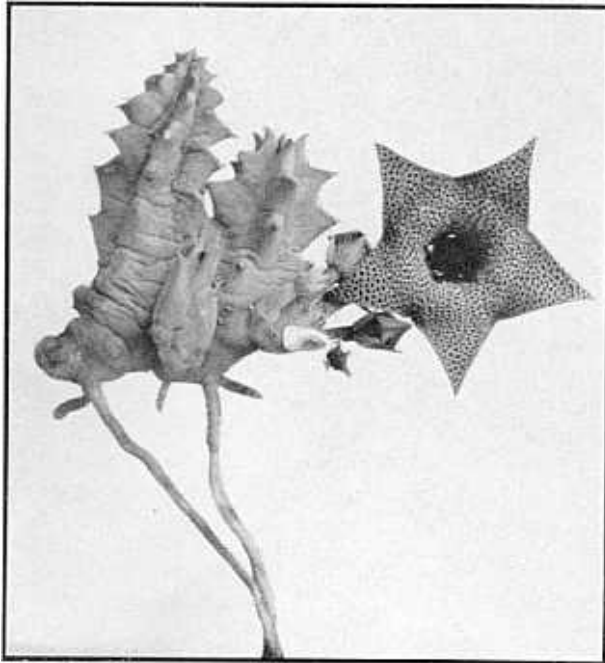
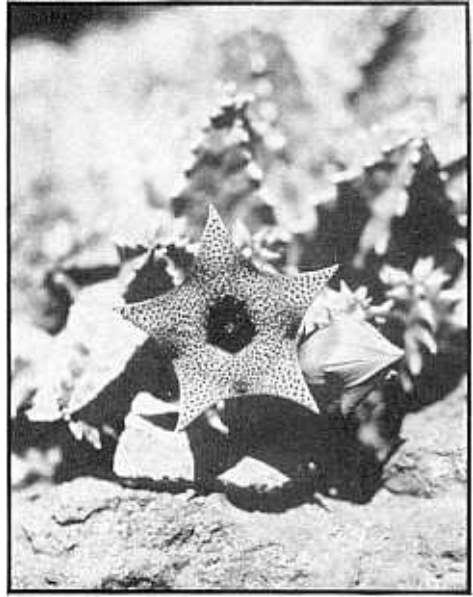


FIG. 908

Huernia brevirostris var. *scabra*,
comb. nov. x 0.8

From Cradock Division. Photo: G. W.
Reynolds, Johannesburg.

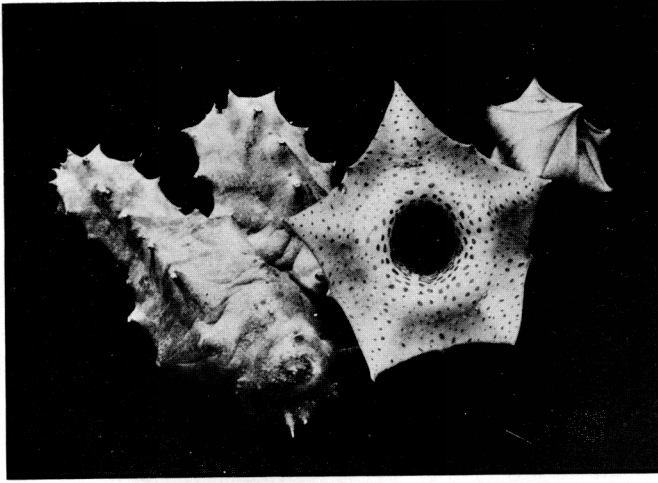


FIG. 909

Huernia brevirostris, form related to the var. *scabra* x 1.

Photo by S. Tapscott.

Var. g. *Huernia brevirostris* var. *longula* (N. E. Brown), comb. nov.

Huernia scabra var. *longula* N. E. Brown, Flora Cap., iv. i. 916. 1909.

(Description by Dr. Brown, l.c.):

Pedicel: 2 to 4 lin. long;

Corolla: 1 to $1\frac{1}{4}$ in. in diameter, slightly convex and somewhat ring-like around the mouth of the tube; *lobes* $4\frac{1}{2}$ to 5 lin. long, 5 to $5\frac{1}{2}$ lin. broad, yellow, with small crimson spots, papillate-scabrous, with the papillae in the throat of the tube not hair-tipped;

Outer corona: entirely blackish-crimson or blackish, with a narrow disk and 5 pairs of obtuse teeth scarcely $\frac{1}{2}$ lin. long;

Inner corona: lobes 1 to $1\frac{1}{4}$ lin. long, rising nearly to the level of the mouth of the tube (in all other forms not nearly attaining to that level);

Otherwise as in the var. *pallida*.

Type locality: Cape Prov.: Beaufort West
Distr.: Rhenoster Kop.

Distribution: Also in Willowmore District.

The "rather long variety" differs from the other forms principally in the extreme length of the inner corona-lobes. It is also distinctive as the only variety in which the papillae on the corolla surface are not tipped with bristles or hairs.

FIG. 910

Huernia brevirostris var. *longula*, comb. nov. x 1.

Photo by H. Herre.

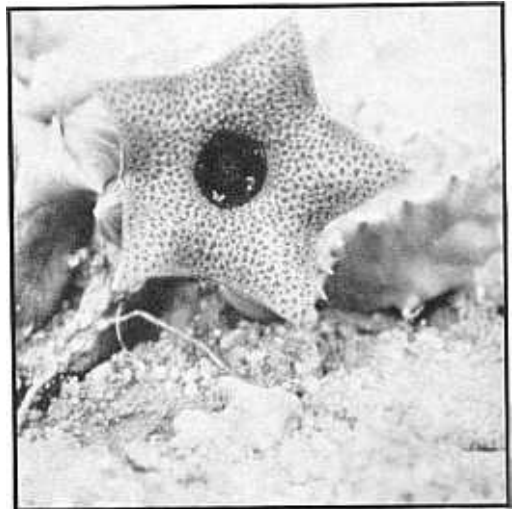




PLATE XXVI.

Huernia brevirostris var. *longula*, comb. nov.

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1935.



FIG. 911

Form related to *Huernia brevirostris* var. *ecornuta*, comb. nov.
x 0.9

Photo by A. F. Tissot. The inner corona-lobes are very short, scarcely exceeding the anthers; the markings on the corolla are limited to the area of the annulus, which they serve to accentuate.

Var. h. *Huernia brevirostris* var. *ecornuta* (N. E. Brown), comb. nov.

Huernia scabra var. *ecornuta* N. E. Brown, Flora Cap., iv. i. 916. 1909.

(Description by Dr. Brown, l.c.):

Corolla: $1\frac{1}{3}$ to $1\frac{1}{2}$ in. in diameter, not or inconspicuously raised into a ring around the mouth of the tube, which widens upwards, pale canary-yellow with light purple spots, not dotted on the outside, papillate-scabrous, with the papillae in the throat and at the mouth of the tube tipped with a short stiff clavate dark purple hair;

Outer corona: disk and lobes dark purple-brown;

Inner corona: lobes closely incumbent upon the anthers and not or scarcely exceeding them, without erect tips, purple.

Type locality: Cape Prov.: Victoria West Distr.: Biesjes Poort.

Distribution: Also in Willowmore District.

This "hornless variety" follows very closely on the var. *pallida* in coloring, but is particularly striking for the change of type in the form of the inner corona-lobes. One must remember that the coronas

throughout the entire group of *H. brevirostris* are extremely variable, and it may be difficult to maintain a variety solely on the coronal details.

11. *Huernia albomaculata*, sp. nov.

(Description by A. White and B. L. Sloane):

Species ignotae originis ad *Huerniam macrocarpam* caulibus evidentius dentatis floribusque parvis campanulatis accedit; *H. concinnae* lobis corollae pulchre purpureo-marginatis assimilatur, maculis autem albicantibus magnis neque regularibus delicatis ab ea differt.

Stems: strongly toothed and resembling those of *H. macrocarpa*; teeth subulate from a stout conical base;

Flowers: 2 or more together, from the base of the young stems, opening successively;

Pedicel: glabrous;

Sepals: 5 mm. long, ovate-lanceolate, acuminate, glabrous;

Corolla: 18 mm. in diameter, with a campanulate tube and spreading lobes; *tube* 8 mm. in diameter and about 6 mm. deep, marbled in red and white within, area around the corona reddish, with some whitish papillae tipped with short purple hairs around the mouth, but otherwise glabrous; disk purplish; *lobes* 6 mm. broad and long, purplish with whitish blotches, which increase in size on the disk to the mouth of the tube, papillose with white papillae tipped with purple;

Outer corona: lobes entire or slightly notched at the apex, blackish-crimson, velvety;

Inner corona: lobes connivent-erect and prolonged above the staminal column, with a small dorsal knuckle or gibbosity, purple-brown at the knuckle, with an edge of blackish at the velvety apex.

Type locality: Unknown.

Distribution: Unknown.

A charming small-flowered *Huernia*, received by us from the collection of A. F. Tissot in Riverside, California. By the general habit of the strongly toothed stems and the small size of the bell-shaped flowers, it appears to belong to the *Macrocarpa* group; but the flowers differ from those hitherto known in this group by the form of the inner corona-lobes, which are prolonged above the anthers, suggesting a South African origin. The lobes are finely margined in purple, recalling a characteristic feature of *H. concinna*, but the large whitish markings from which the species takes its name are more irregular than the fine spots of *H. concinna*. They are also quite distinct from the regular fine lines on the corolla of *H. macrocarpa*.

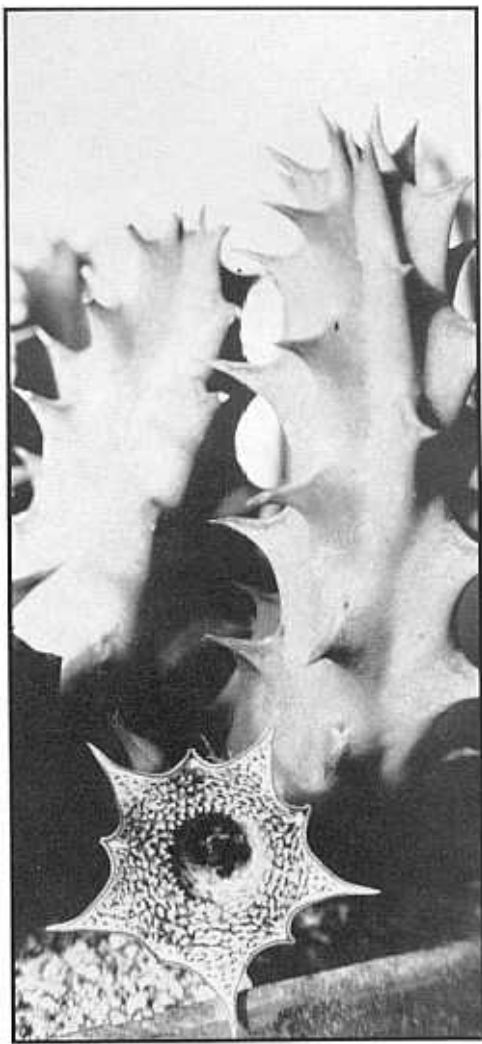


FIG. 912

Huernia albomaculata, sp. nov. x 2.

From the collection of A. F. Tissot.

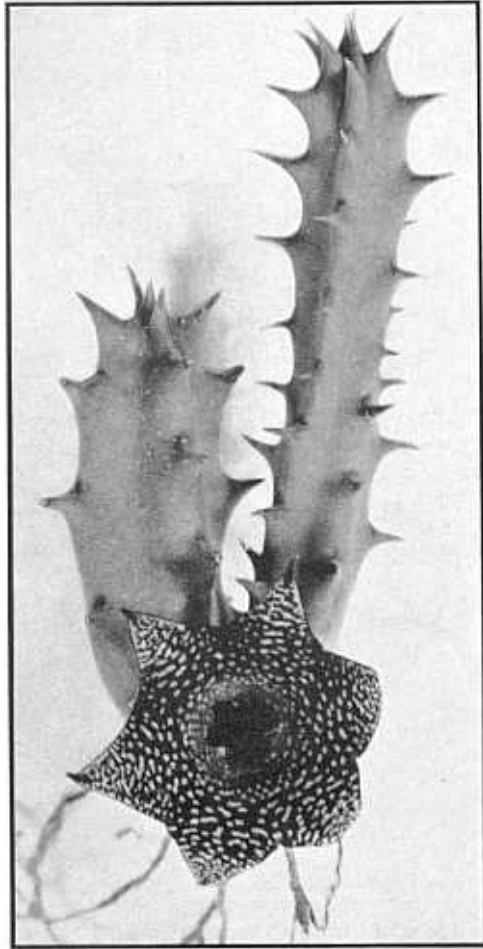


FIG. 913

Huernia transmutata, sp. nov. x 1.6

From the collection of A. F. Tissot.

12. *Huernia transmutata*, sp. nov.

(Description by A. White and B. L. Sloane) :

Caulium aspectu, florum forma magnitudineque, corolla papillata, coronae modo species nostra ad *H. brevirostrem* accedit, sed primo intuitu coloris ratione exacte inversa distinguitur. Formae omnes *H. brevirostris* colore basico pallescente, maculis interdum tantum coccineis irregularibus, lineis praeter in tubo nullis gaudent. *H. transmutatae* flores colore fusco-brunneo maculis lineisque delicatis insignito oculos offendunt.

Stems: erect or ascending, 5 cm. long, acutely 4 or 5-angled, glabrous, with short deltoid acute teeth;

Flowers: 2 or more together, near the base of the young stems, successively developed;

Pedice: 10 to 12 mm. long, 2 mm. thick, glabrous;

Sepals: 12 mm. long, lanceolate, acuminate, glabrous;

Corolla: 3 cm. in diameter, with a campanulate tube and abruptly spreading lobes; outside prominently five-nerved, pinkish with tiny faint deeper pink spots; *tube* 12 mm. in diameter and 5 mm. deep, maroon color within, with small scattered spots of cream; *lobes* 8 mm. long, 8 to 10

mm. broad at the base, deltoid, acuminate, recurved near the apex, dark maroon with a few yellowish transverse lines near the apex, nearer the base and on the disk with many light yellowish spots, rising into papillae of the same color tipped with a tiny maroon cell, some papillae principally in throat of tube tipped with a short stiff maroon bristle;

Outer corona: lobes 1.5 mm. long, blackish-purple, velvety, with a shallow notch at the apex;

Inner corona: lobes connivent-erect, prolonged above the staminal column, blackish-purple with velvety tips, knuckle brownish, not prominent.

Type locality: Unknown.

Distribution: Unknown.

We have received this curious "transmuted *Huernia*" from the collection of A. F. Tissot in Riverside, California. It is closely related to *H. brevirostris* by the character of its stems, the size and shape of its flowers, the inside lining of papillae on the corolla, and the coronal form; but it differs in the complete reversal of the coloring. All the varieties and forms of the protean *H. brevirostris* have a pale yellow to

creamy-white ground color. This is either unmarked, or marked with spots of various density and size in crimson, purple or maroon. There are no linear markings, except sometimes within the tube. On the other hand, *H. transmutata* is strikingly conspicuous for its dark maroon color, rather lightly banded and spotted with yellow. So complete is the transmutation that we have felt it should receive specific rank.

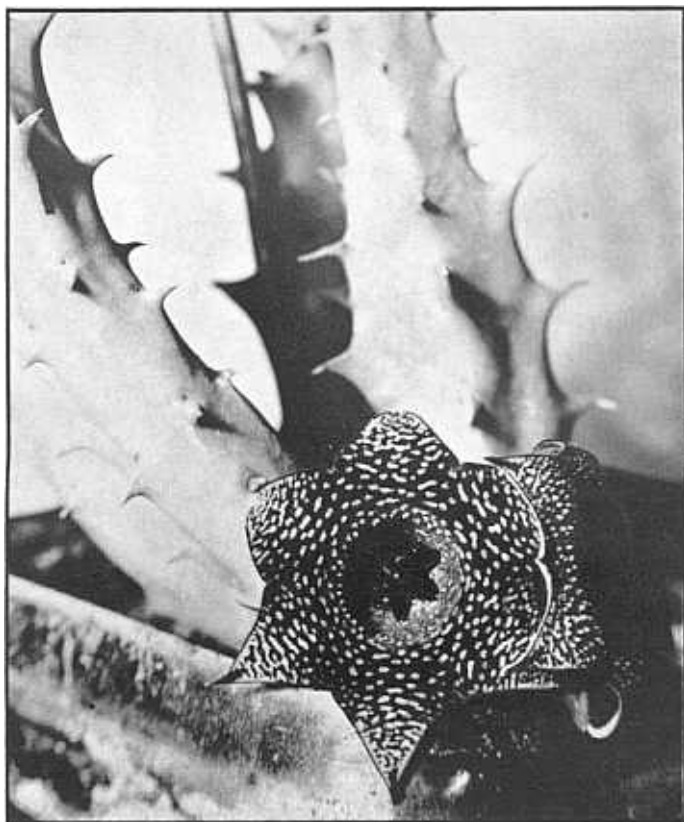


FIG. 914

Huernia transmutata, sp. nov.

From the collection of A. F. Tissot.

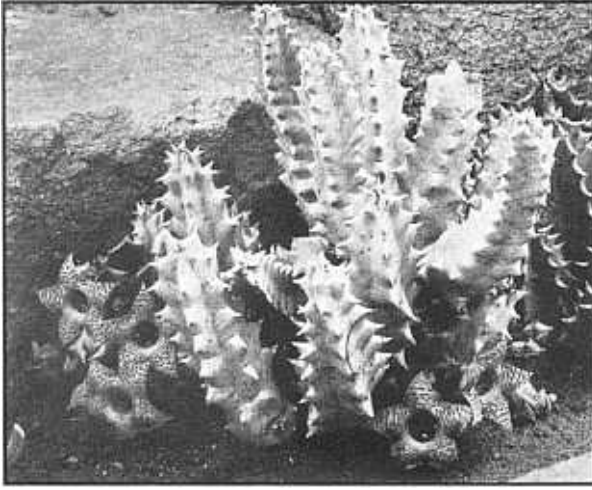


FIG. 915

Huernia thureti Cels x 0.5

Photo by S. Tapscott.

13. *Huernia thureti* Cels, Horticult. Fr., 73. 1866.*Stapelia thureti* Croucher, The Garden, xii. 524. 1877.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 914):

Stems: 1 to 2 in. high, 3 to 4 lin. thick, acutely 4 to 5-angled, glabrous, glaucous-green; teeth 1 to $1\frac{1}{2}$ lin. long, deltoid, acute;

Flowers: 1 to 4 together, successively developed at the base of the stems;

Pedicel: 6 to 8 lin. long, 1 to $1\frac{1}{4}$ lin. thick, glabrous;

Sepals: $2\frac{1}{2}$ lin. long, lanceolate-subulate, glabrous;

Corolla: 1 in. in diameter; *tube* subglobose-campanulate, about $\frac{1}{3}$ in. long and $4\frac{1}{2}$ lin. in diameter outside, slightly constricted at the mouth, disk and lobes horizontally spreading abruptly from the tube; *lobes* 4 lin. long, $4\frac{1}{2}$ lin. broad, deltoid, very acute; outside and within quite glabrous, without processes or papillae on the inner face, buff-colored or yellow-ochre, marked on the lobes with numerous small blood-red spots, those on the disk transversely elongated, passing into transverse lines in the tube, which is blood-red at the base;

Outer corona: lobes about $\frac{2}{3}$ lin. long and 1 lin. broad, subquadrate, bifid, alternating with 5 minute tubercles, nearly black;

Inner corona: lobes about 1 lin. long, subulate, connivent-erect, with the slightly spreading tips produced $\frac{3}{4}$ lin. or more above the anthers, with a slight transverse thickening at the base, purple-brown.

Type locality: South Africa: without locality.

Distribution: Transkei: near Tsomo (?); Port Elizabeth Distr.; Albany Distr.: on rocky outcrop near dry scrub, along Peddie Road 20 miles from Grahamstown.

"Thuret's *Huernia*" is a charming species, with flowers an inch or slightly less in diameter, like little bells with the lobes flaring abruptly outward. The corolla surface is entirely smooth and glabrous, a con-

dition found in no other *Huernia*, except *H. primulina*. The lobes are ochre-yellow, spotted with small blood-red dots, while the disk and tube are marked with lines of the same color, and the bottom of the tube

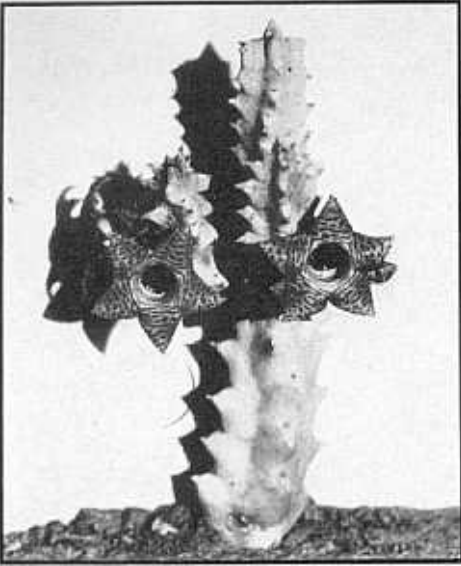


FIG. 916

Huernia unidentified

Photo by S. Tapscott, who writes: "I received this plant from Miss M. Wilman, but without locality. The flowers are similar to *H. thureti*, but smaller and with short pedicels. I think it is a variety of *H. thureti*."

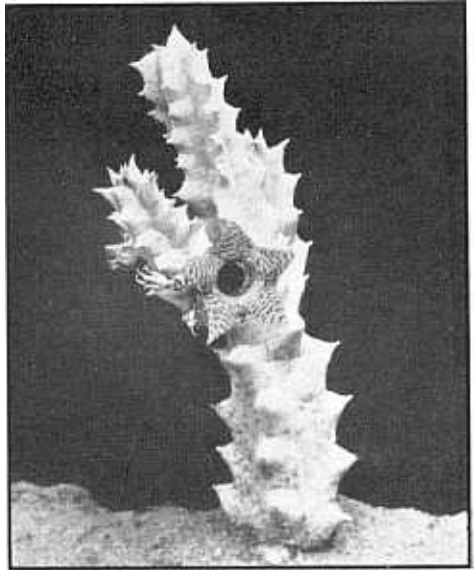


FIG. 917

Huernia unidentified

Photo by S. Tapscott of the same plant shown in Fig. 916.

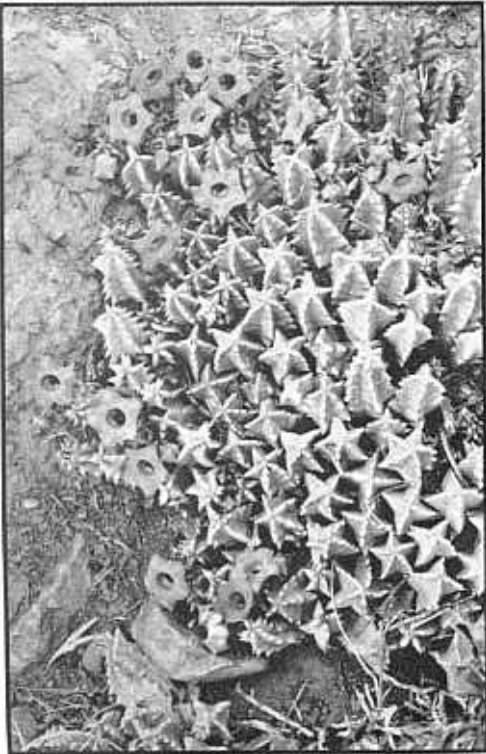


FIG. 918

Huernia thureti Cels x 0.3

Photo: G. W. Reynolds, Johannesburg, of a plant in natural surroundings on the Peddie Road, Albany district, growing in association with the plants of *H. primulina* shown on p. 842.

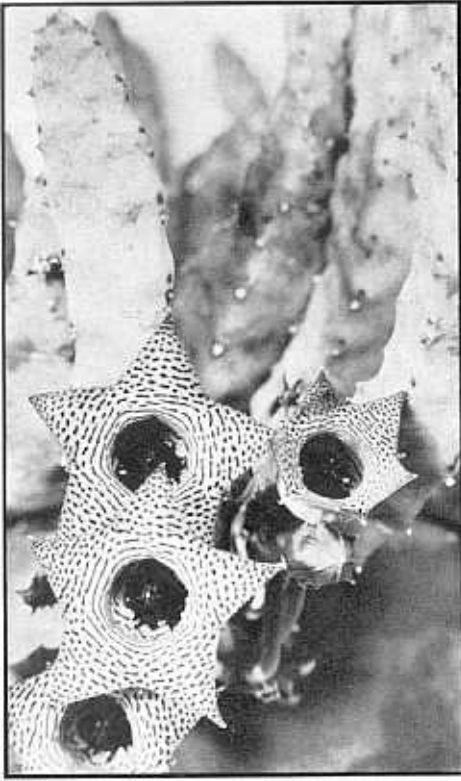


FIG. 919

Huernia thureti Cels x 1.25

is wholly blood-red. The origin of the plant (prior to 1866) is unknown. It has been collected since in the south-eastern part of the Cape Province, and is now fairly frequent in cultivation. It was named for Gustave Adolphe Thuret (1817-1875), remembered for his studies on marine algae and for his establishment of a famous Botanic Garden at Antibes on the French Riviera. Thuret came of a Huguenot family, which for a time had sought refuge in Holland. There the French name had become corrupted, the final "t" being sound-

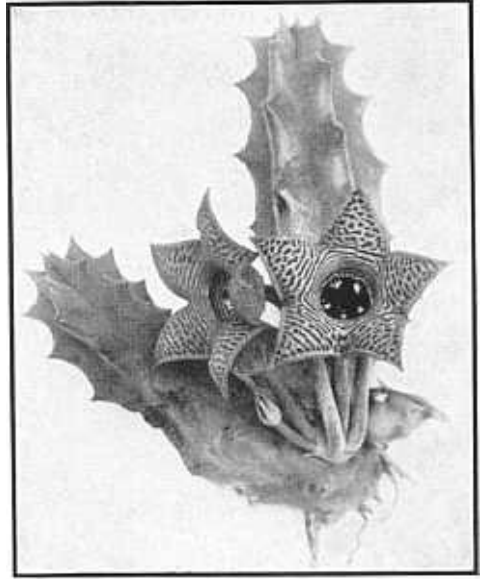


FIG. 920

Huernia thureti Cels x 1

Photo by S. Tapscott.

ed. Hence the specific name should be pronounced as though it were spelled "thuretti."

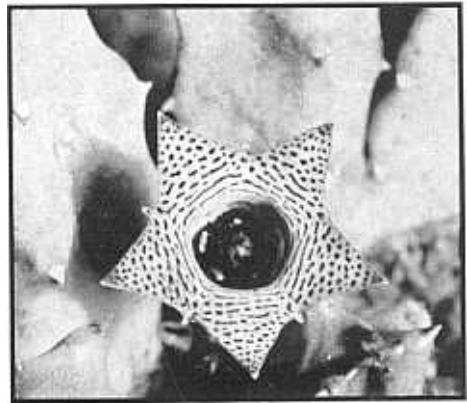


FIG. 921

Huernia thureti Cels x 1.5



"I have a favorite patch of *H. thureti*," says G. W. Reynolds, "on the Peddie Road in Albany district. There are at least two very distinct forms. One with larger flowers, here shown at left, has the corolla 2.5 cm. from tip to tip of two lobes, the markings wider and spaced further apart; the other has the corolla only 2.1 cm. across, and the purplish broken lines are finer and closer. This form is shown in the picture below."

FIG. 922

Huernia thureti Cels x 1.

Photo: G. W. Reynolds, Johannesburg.

"My patch of *H. thureti*," continues Mr. Reynolds, "is in the mist belt, between Frasers Tower and Komsfontein, 20 miles east of Grahamstown. The plant grows there in clumps up to about 50 stems, with 4, 5 and 6-angled stems, some with a slight spiral twist, all in the same clump. The largest clump would be about 18 inches across. Often there are two dozen or more flowers in bloom to a clump, six to nine from the base of a stem. The height of the flowering season is in April."

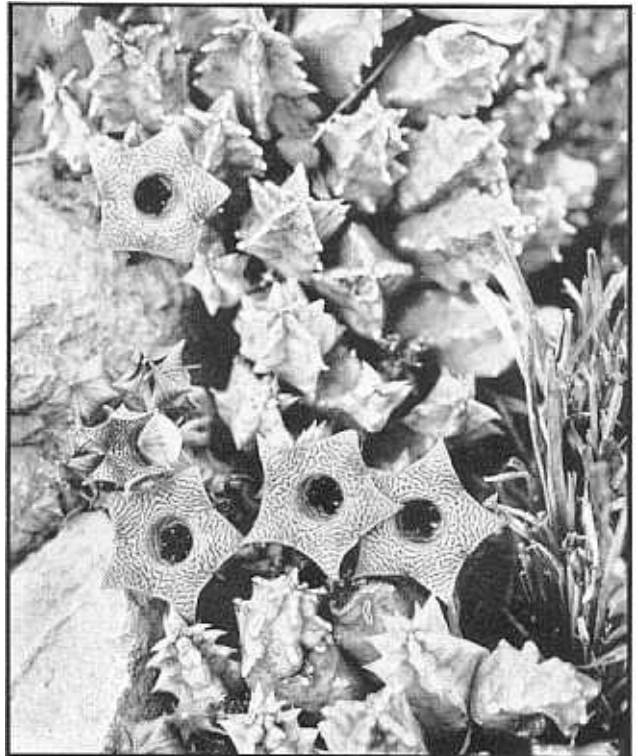


FIG. 923

Huernia thureti Cels x 1.

Photo: G. W. Reynolds.

14. *Huernia piersii* N. E. Brown, Flora Cap., iv. i. 909. 1909.

(Description by Dr. Brown, l.c.):

Plant: 1 to $1\frac{1}{2}$ in. high, with short erect crowded acutely 4-angled *stems*, $\frac{3}{4}$ to $1\frac{1}{4}$ in. long and about $\frac{1}{2}$ in. square, with acute spreading teeth about 1 lin. long, glabrous, green, mottled with dull purplish;

Flowers: 2 to 3 together, near the base of the young stems;

*Pedice*l: $\frac{1}{4}$ in. (or more?) long (only 1 detached flower seen), glabrous;

Sepals: $\frac{1}{8}$ in. long, ovate-lanceolate, acuminate, glabrous;

Corolla: 1 to $1\frac{1}{4}$ in. in diameter; *tube* campanulate, $\frac{1}{4}$ in. long, 5 lin. in diameter outside; *lobes* spreading very abruptly from the tube, 4 to $4\frac{1}{2}$ lin. long and broad, deltoid, very acutely (almost subulate-) acuminate, glabrous and smooth outside; inner surface very minutely papillate on the lobes only, smooth elsewhere, but thinly bearded with long stiff outstanding purple-brown hairs in the throat and around the mouth of the tube, deep ochreous-yellow, spotted and the minute papillae tipped with purple or crimson, with the spots passing into transverse lines at the mouth of the tube, which is creamy white with purple transverse lines and wholly purple around the corona;

Outer corona: lobes about $\frac{2}{3}$ lin. long and broad, shortly connate at the base, subquadrate and very deeply bifid, black;

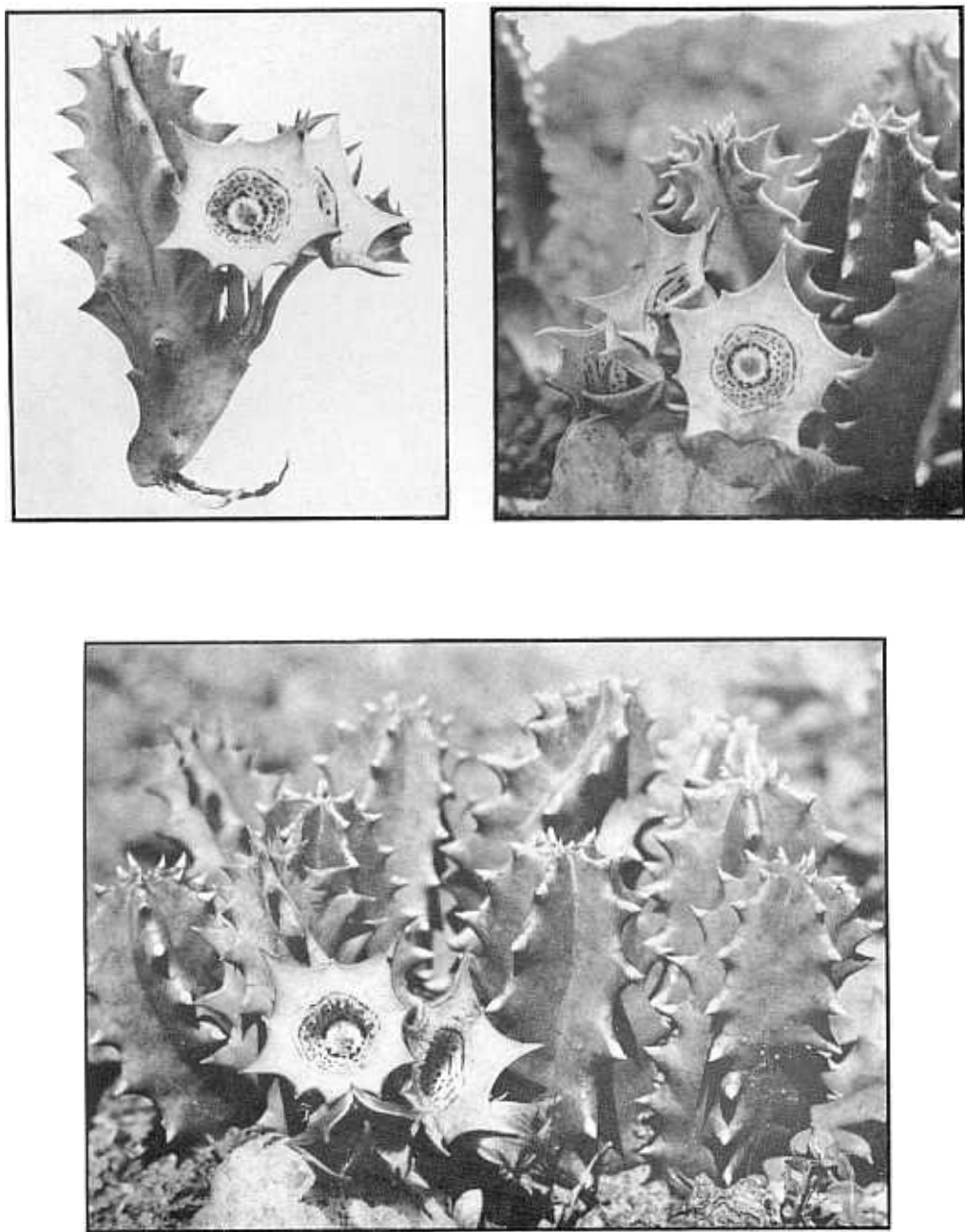
Inner corona: lobes $\frac{1}{8}$ in. long, subulate, acute, with a transverse ridge at their base, connivent-erect much above the anthers, with diverging tips, purple.

Type locality: Cape Prov.: Wodehouse Distr.: Carnarvon Farm, near the railway between Sterkstroom and Indwe.

Distribution: Not further known.

Named for the discoverer, C. Piers. It has short $1\frac{1}{2}$ -inch stems, 4-angled, with $1\frac{1}{4}$ -inch flowers, ochreous-yellow spotted with purple or crimson. The campanulate

tube is thinly bearded with long stiff purple-brown hairs and the lobes are very minutely papillate.



FIGS. 924-926

Huernia quinta, comb. nov. x 1.

Photos: G. W. Reynolds, Johannesburg, of a plant from the Waterberg district: on the Palala Road, 20 miles west of Naboomspruit.

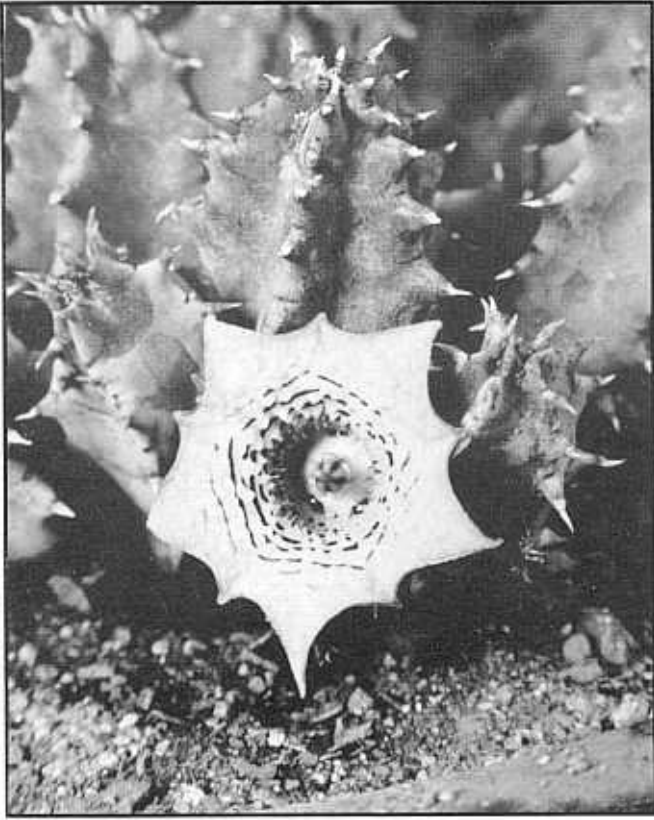


FIG. 927

Huernia quinta, comb. nov. x 1.5

15. *Huernia quinta* (Phillips), comb. nov.

Huernia scabra var. *quinta* Phillips, Flow. Pl. So. Afr., t. 444. 1932.

(Description by Dr. E. P. Phillips, l.c.):

Stems: up to 7 cm. high, 2.5 cm. in diameter including the teeth, 4-angled, glabrous; angles acute and the teeth tipped with a hard horny point;

Flowers: in groups of 4 to 7 from the base of the stems;

Pedicel: 13 mm. long, terete, glabrous;

Sepals: 4 mm. long, ovate, acuminate, glabrous;

Corolla: 2.7 cm. in diameter when fully expanded; *tube* campanulate, 4 mm. long, 9 mm. in diameter at the mouth, banded with dark red, scarcely with a raised ring around the mouth, papillate at the mouth, with the papillae tipped with short bristles; *limb* horizontally spreading, papillate; *lobes* 8 mm. long, 9 mm. broad at the base, ovate, shortly acuminate, papillate;

Outer corona: lining the base of the corolla-tube, disk-like; lobes 1 mm. long, 1.5 mm. broad, shortly bifid with the segments obtuse;

Inner corona: overtopping the staminal column; lobes 3 mm. long, subulate above, with a thickened ridge just below the subulate portion.

Type locality: South Africa: without precise locality.

Distribution: Transvaal: Potgietersrust Distr.: Kwarries Hoek.

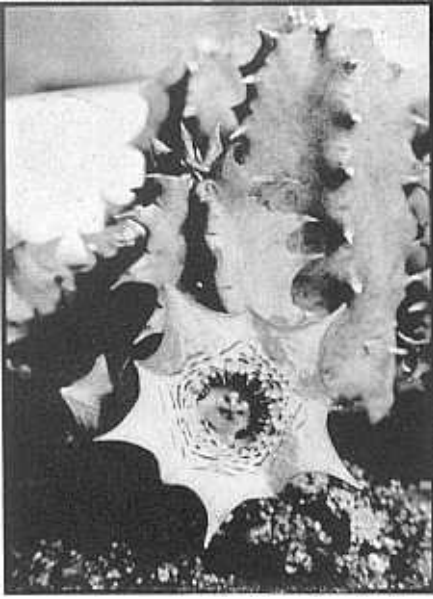


FIG. 928

Huernia quinta, comb. nov. x 1

The "fifth *Huernia*" has carried over its odd name from its earlier position as a variety of the quondam *Huernia scabra*, where it was known as the "fifth variety." In uniting *H. scabra* and its varieties with *H. brevirostris*, we decided to keep this fifth variety separate and have elevated it to specific rank.

Throughout the wide range of permutations which makes up the species, *H. brevirostris*, the corolla is either spotted with round dots of varying size, or wholly unmarked. The dots sometimes become confluent into thick lines in the tube, but never on the disk. In *H. quinta*, on the other hand, the corolla is banded on the disk with fine concentric red lines, unrelated to the *H. brevirostris* pattern. The corona follows *H. brevirostris*, except that the outer corona-lobes are paler and the inner corona-lobes are not produced above the anthers,

approaching in this respect to the var. *ecornuta*. The plant stems are described as 4-angled, but occasional 5-angled stems occur.

The discoverer of *H. quinta* remains unknown. It was described from a plant growing in the garden of J. C. van Balen in Pretoria. It has since been collected in the Potgietersrust district of the Transvaal.

H. quinta happens to be the fifteenth, and not the fifth, species in our roll of the colorful *Huernias*. But, remembering the preeminence accorded by the Pythagoreans to such fifth elements of a series as the "fifth essence," we can think of *H. quinta* as suggesting by its name that it has distilled in itself the quintessence of all that is charming and beautiful in the genus. It is an altogether lovely species.

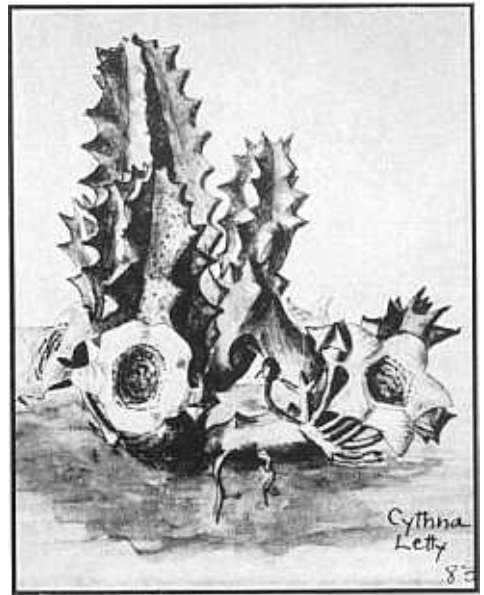


FIG. 929

Huernia quinta, comb. nov. x 0.65

From the original water color drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1932.



FIG. 930

Huernia namaquensis Pillans x 1.25

From Van Rhynsdorp, C. P. Photo by C. Luckhoff.

16. *Huernia namaquensis* Pillans, Journ. Bot., 102. 1930.

(Description by N. S. Pillans, l.c., translated from the Latin) :

Stems: erect, $3\frac{1}{2}$ to 6 cm. high, 1 to $1\frac{1}{2}$ cm. thick, obtusely 4 to 5-angled, with deltoid compressed teeth, 3 to 4 mm. long, shortly apiculate, glabrous, green, flecked with dull purple;

Flowers: in cymes of 2 to 4, from the base of the stems;

Pedicel: about 1 cm. long, glabrous;

Sepals: about 3 mm. long, lanceolate-acuminate, glabrous;

Corolla: 2.4 to 2.6 cm. in diameter; *tube* 6 mm. deep, 8 mm. in diameter at the mouth, outside pale primrose, inside whitish-yellow, slightly spotted in purple, lightly papillate near the mouth with obtuse papillae minutely dotted with purple and terminating in a minute bristle; *limb* spreading from the mouth of the tube, whitish-yellow, slightly spotted in purple, obtusely papillate; *disk* 4 mm. broad; *lobes* about 5 mm. long, deltoid-acute, convex above, subdeclinate towards the apex, with the sinuses produced into intermediate teeth, 1 mm. long, broadly deltoid;

Outer corona: $4\frac{1}{2}$ mm. in diameter, appressed to the tube, subequally 10-toothed, or with 5 deeply bifid lobes, washed with purple, with short hairs like papillae; teeth 1 mm. long, ovate-elliptical, obtuse;

Inner corona: lobes $1\frac{1}{4}$ mm. long, subulate acute, at the base with a slight transverse ridge, incumbent upon the anthers and produced about $\frac{1}{2}$ mm. beyond them into connivent-erect tips, purple at the base, golden above.

Type locality: Cape Prov.: Little Namaqualand: sides of rocky gorge at Holgat.

Distribution: Also recorded from Van Rhynsdorp Distr.

Discovered in 1926 by Mr. Pillans in Little Namaqualand, whence the name. The affinity of the species is with *Huernia brevirostris* var. *scabra*, from which the flowers differ, according to Mr. Pillans, "by the absence of clavate hairs from the papil-

lae, by the absence of a purple area at the base of the tube within, and by the shorter inner corona-lobes." The flowers are very charming, with delicate purple spots on a whitish-yellow ground.

17. *Huernia nouhuysii* Verdoorn, Flow. Pl. So. Afr., t. 412. 1931.

(Description by Miss I. C. Verdoorn, l.c.):

Stems: 8 to 20 cm. high, erect, branched; branches acutely 4 to 6-angled, usually spirally twisted; teeth on the angles 5 mm. long, deltoid, acute;*Flowers*: several together near the base of the branches;*Pedicel*: 2 to 3 cm. long, stout, glabrous;*Sepals*: 6 mm. long, subulate from an ovate base;*Corolla*: campanulate, with the *tube* gradually passing into the spreading lobes, about 13 mm. in diameter at the throat; *lobes* about 5 mm. long, deltoid, acute, alternating with small teeth; inner surface greenish with red spots and lines and covered from about the middle of the tube to the tips of the lobes with small conical processes tipped with a minute red mucro;*Outer corona*: equally and shallowly 10-lobed, light greenish-yellow;*Inner corona*: of 5 linear subulate lobes with a dorsal ridge, incumbent on the anthers and produced beyond into erect apices which are not obviously thickened at the tips.

Type locality: Transvaal: Zoutpansberg Distr.: near Wylie's Poort.

Distribution: Not further known.

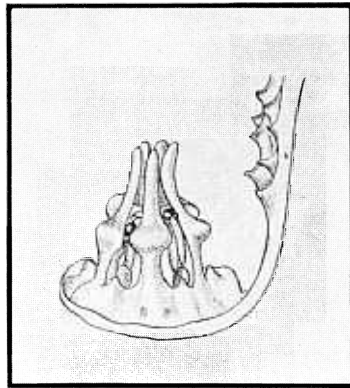


FIG. 931

Huernia nouhuysii Verdoorn

Enlargement of the corona, with part of wall of corolla-tube in longitudinal section, from a drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1931.

Discovered by J. J. van Nouhuys, for whom it is named, in the northern Transvaal about 1930. It is allied to *Huernia loeseneriana*, but is distinguished by the usually spirally twisted stems, which have angles varying from 4 to 6 in number, instead of the constant 4 angles of *H. loeseneriana*. The flowers are borne in conspicuous clusters. While they very much resemble those of *H. loeseneriana*, it is important to notice that the inner corona belongs to the *Orthostelma* division of the *Huernias*, instead of to the *Calostelmas*, as do the inner coronas of *H. loeseneriana* and *H. longituba*.

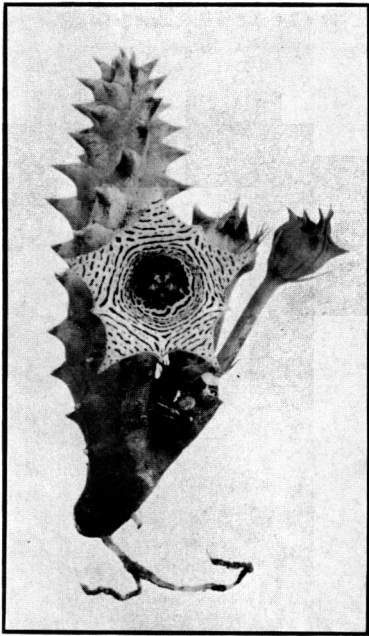


FIG. 933

Huernia nouhuysii Verdoorn x 1.

Photo: G. W. Reynolds, Johannesburg.



FIG. 932

Huernia nouhuysii Verdoorn x 0.5

From the original water color drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1931.

18. *Huernia witzenbergensis* Luckhoff, sp. nov.

(Description by C. Luckhoff):

Caules erecti, 5-7 cm. longi, 1-2 cm. crassi, acute 4-5 angulati, glabri, virides, dentibus compressis deltoideis 5-6 mm. longis; flores 2-6 ad basin ramorum fasciculati; pedicellus 1.5-2 cm. longus, 2.5 mm. crassus, glaber; sepala 6 mm. longa, ad apice subulata, basi ovata; corolla aestivo turbinata, supra fere plana, expansa 4 cm. diametro; extra glabra, nervibus prominentibus; tubus 6 mm. longus, 1.2 cm. diametro, campanulatus, ore constrictus, glaber, luteus; limbus abrupte patens, papillatus, disco luteo, lobis sub-recurvis, acutis vel subacuminatis, 1.3 cm. longis, 1.5 cm. latis, nigris, non nitentibus; lobi coronae exteriori 2 mm. longi, subquadrati, bifidi, atro-rubri; lobi coronae interiori 2.5 mm. longi, connivente-erecti, apicibus patenti, acuminati, lutei.

Stems: erect, 5 to 7 cm. long, 1 to 2 cm. thick excluding the teeth, sharply 4 to 5-angled, glabrous, green, tinged with purple; teeth spreading, 5 to 6 mm. long, compressed-deltoid, with acute tips;

Flowers: 2 to 6 in a fascicle near the base of the young stems, successively developed;

Pedicel: 1.5 to 2 cm. long, 2.5 mm. thick, glabrous;

Sepals: 6 mm. long, 2 mm. broad at the base, subulate from an ovate base, glabrous;

Corolla: in bud somewhat turbinate, flat-topped, acutely 5-angled; when expanded 4 cm. in diameter, prominently nerved on the glabrous outside; *tube* 6 mm. long, 1.2 cm. in diameter, campanulate, constricted at the mouth inside; *limb* abruptly spreading, with somewhat recurved lobes 1.3 cm. long, 1.5 cm. broad, acute or subacuminate, smooth and glabrous in the tube, elsewhere covered with watery papillae, those at the mouth of the tube tipped with a short hair; tube and disk bright sulphur yellow, lobes a dull black, not shining;

Outer corona: lobes 2 mm. long, subquadrangle, not joined at base, shortly bifid, dull crimson;

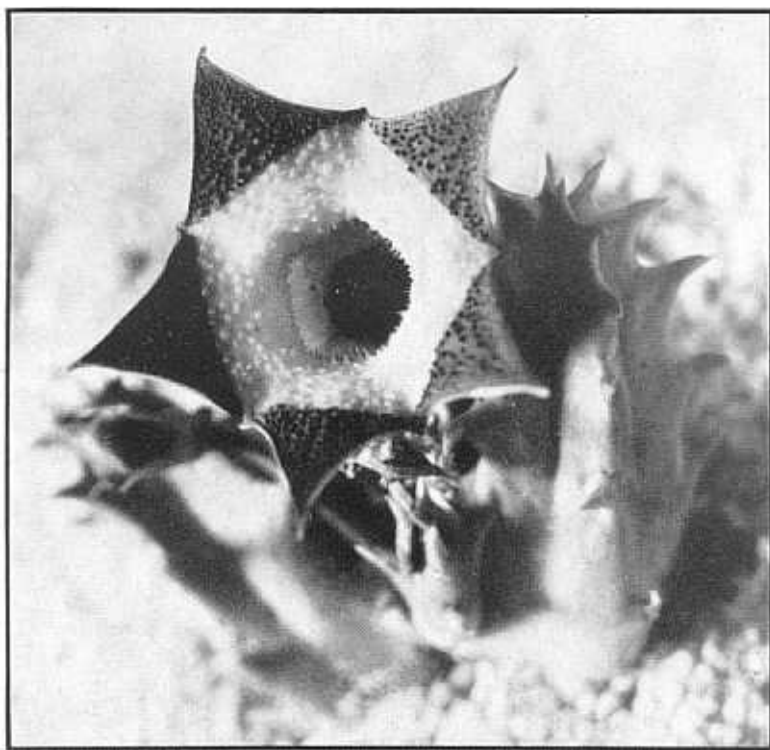


FIG. 934

Huernia witzenbergensis Luckhoff x 2.

Photo by Carl Luckhoff.

Inner corona: lobes 2.5 mm. long, connivent-erect, with spreading tips, acuminate, with a transverse ridge at the base, dull yellow.

Type locality: Cape Prov.: Tulbagh Distr. : at the foot of the Witzenberg Mountains, in the Valley of Waveren.

Distribution: Not further known.

The "Witzenberg *Huernia*" is an extremely rare and striking species. It was discovered a few years ago by C. Luckhoff in a single plant on the lower slopes of the Witzenberg Mountains, in the Waveren Valley. These are the mountains which were dedicated in 1699 to the honor of Nicolaas Witsen, as told in Appendix B, and it would certainly have stirred the great Amsterdam Burgomaster's heart to know that his mountains harbored so strange and interesting a Stapeliad. The plant was in flower at the time of its discovery, but has not flowered again since. It resembles *H. brevirostris* var. *immaculata*, except for the remarkable dull jet-black color of the corolla-lobes. This feature takes the species completely out of the *H. brevirostris* group of varieties, in which the markings are restricted to round spots of various sizes in

shades of red and purple, and combined with the habitat it fully justifies the consideration of the plant as a distinct species. The habitat, far removed from the *H. brevirostris* territory, is probably the nearest point to Capetown at which any *Huernia* has been found.

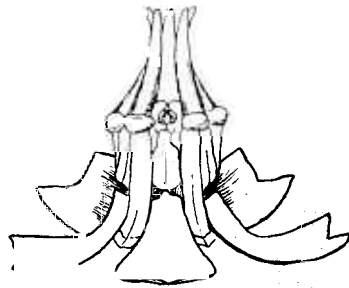


FIG. 935

Corona of *Huernia witzenbergensis* Luckhoff
Drawing by Carl Luckhoff.

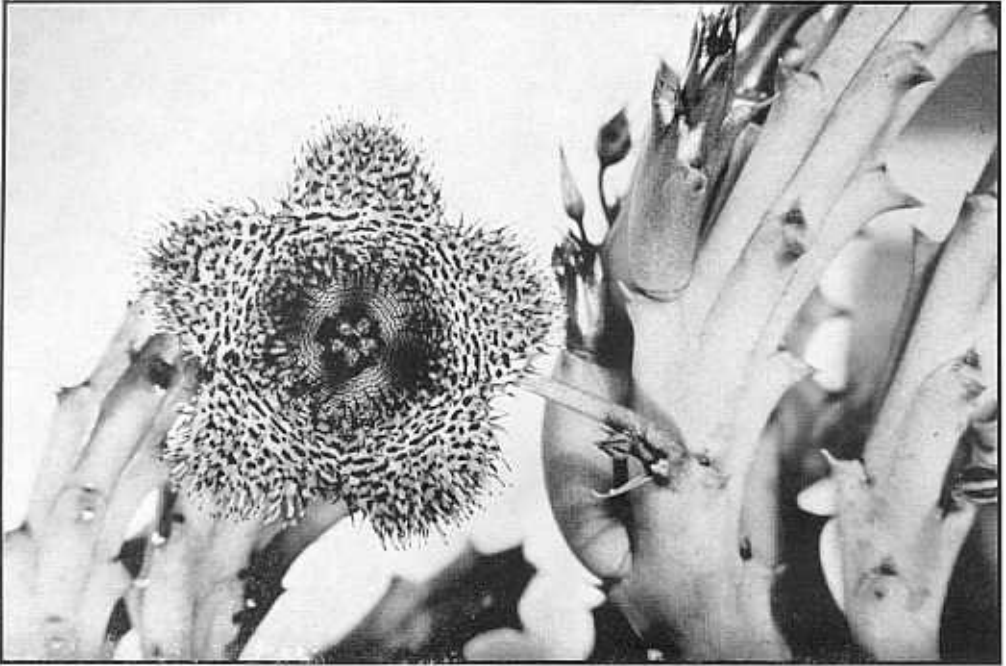


FIG. 936

Huernia hystrix N. E. Brown x 1.25

19. *Huernia hystrix* (Hooker fil.) N. E. Brown, Gard. Chron., v. 795. 1876.

Stapelia hystrix Hooker fil., Bot. Mag., t. 5751. 1869.

(Description by Dr. Brown, Flora Cap., iv. i. 911):

Stems: usually 2 to 3 (rarely, under cultivation, up to 5) in. high, 4 to 6 lin. thick, 5-angled, glabrous, pale green, very slightly glaucous, sometimes tinted with dull purplish; teeth conical, acute, very spreading;

Flowers: 2 to 5 together near the base of the stems, successively developed;

*Pedice*l: $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, glabrous;

Sepals: 4 lin. long, $\frac{3}{4}$ lin. broad, subulate from an ovate-lanceolate base, glabrous;

Corolla: shortly pointed and with a small tooth at each angle in bud; when expanded 1 to $1\frac{1}{2}$ in. in diameter; *tube* short, campanulate, about $\frac{1}{4}$ in. long and $\frac{1}{2}$ in. in diameter outside; *lobes* abruptly and horizontally spreading from the tube, with recurved tips, $\frac{1}{2}$ to $\frac{2}{3}$ in. long and nearly as broad at the base, deltoid-ovate, acute; outside glabrous, but minutely papillate, pitted, prominently 3-nerved on the lobes; inner surface (except within the tube) covered with spine-like acute fleshy processes, ochreous-yellow, marked with crimson spots on the lobes and with numerous transverse crimson lines within the smooth and paler tube;

Outer corona: lobes half as long as broad, truncate, broadly emarginate or obscurely 3-toothed at the apex, black (apparently yellowish in a dried flower of J. Medley Wood);

Inner corona: lobes $1\frac{1}{2}$ lin. long, erect, much exceeding the staminal column, linear with a transverse thickening or ridge on the back below and expanded at the apex into a horizontally spreading process somewhat resembling an inverted foot, yellow, dotted on the upper part with crimson.

Type locality: Natal: without precise locality, "on mountains."

Distribution: Natal: near Weenen; Muden Valley, north-west of Greytown; Umlaas Valley, west of Camperdown; and in Zululand: Eshowe; Orange Free State; Portu-

guese East Africa: Mangulane; Transvaal: Barberton Distr.: Louwscreek; Plaston; etc.; Pietersburg Distr.: Mokeetsi, on open rocky slope; Zoutpansberg Distr.: Shilovane; ?Southern Rhodesia: Matabeleland.

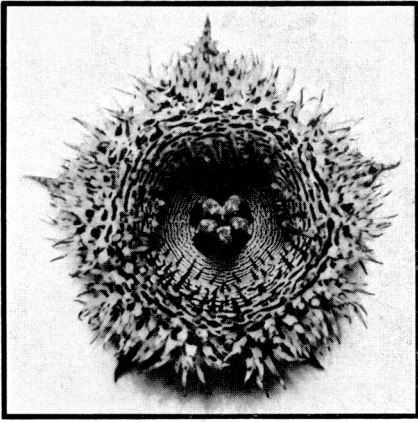


FIG. 937. *Huernia hystrix* N. E. Brown x 2.
A form with the outer corona-lobes almost black.

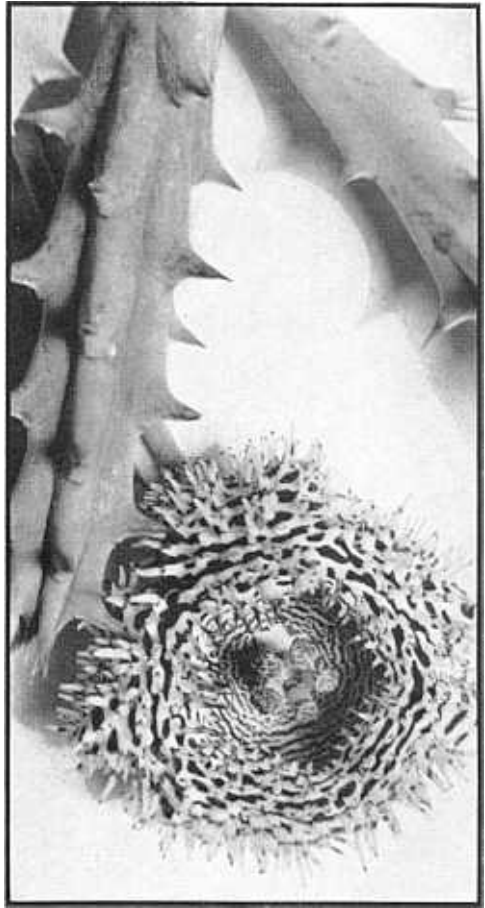


FIG. 939
Huernia hystrix N. E. Brown x 1.5

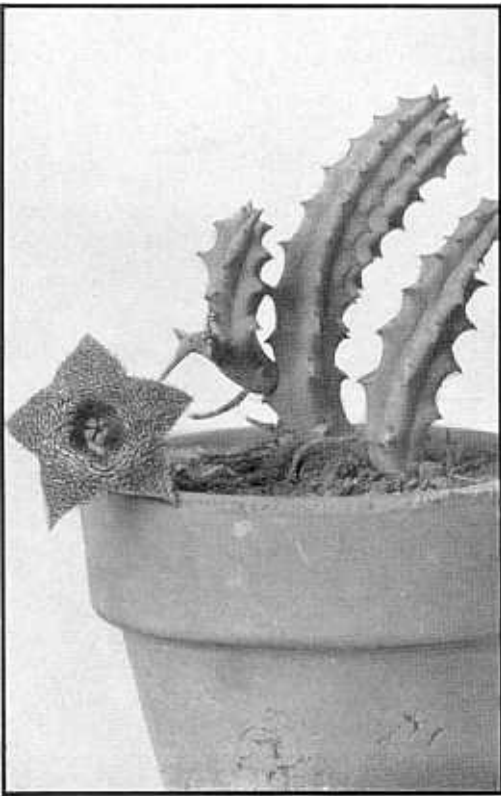


FIG. 938. *Huernia hystrix* N. E. Brown x 0.7
From W. I. Beecroft Gardens. Photo by Havens.

The "porcupine *Huernia*" is named for the spiny, fleshy papillae, which cover the inner corolla surface so completely that the intermediate *Huernia* points at the sinuses between the lobes can hardly be seen at all. The corolla is ochreous-yellow, banded and dotted with red, and the papillae are themselves tipped with red. *H. hystrix* has a wide range, from Natal across the Transvaal and Portuguese East Africa, and probably well up into Southern Rhodesia. It is a variable species in several respects.

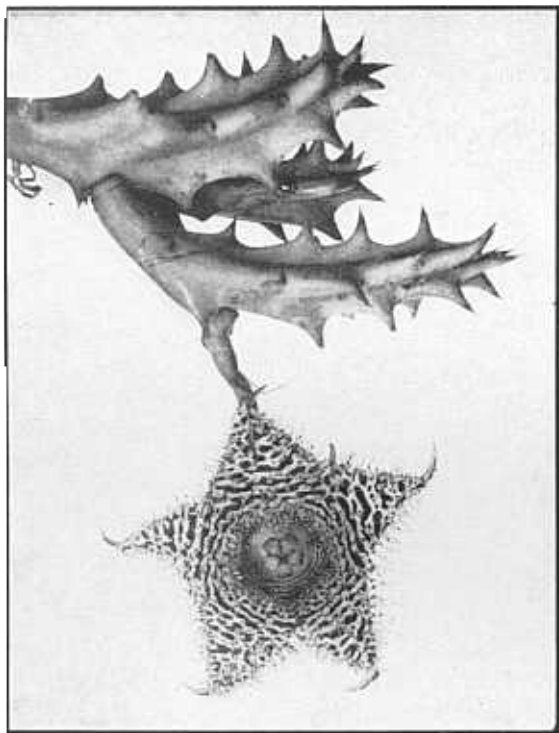


FIG. 940

Huernia bystrix N. E.

Brown x 1.

From Barberton, Transvaal

Photo: G. W. Reynolds.

Johannesburg.

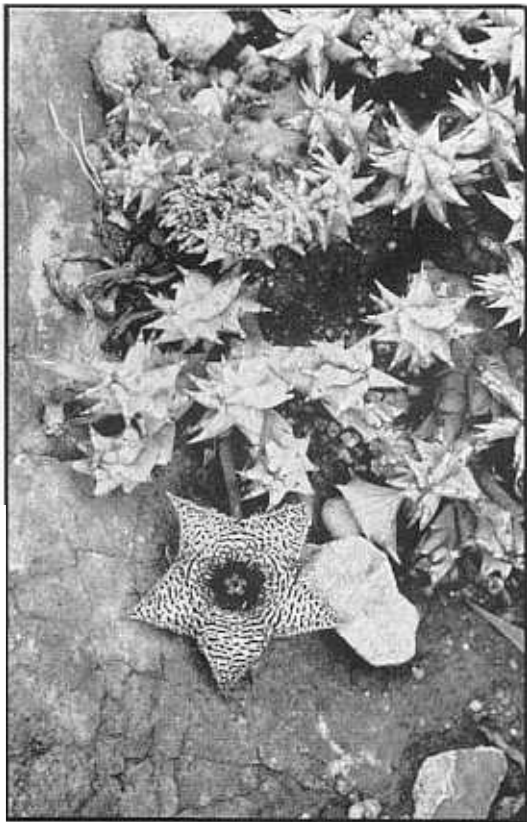


FIG. 941

Huernia bystrix N. E. Brown x 0.7

From Umlaas Valley, Natal.

Photo: G. W. Reynolds, Johannesburg.

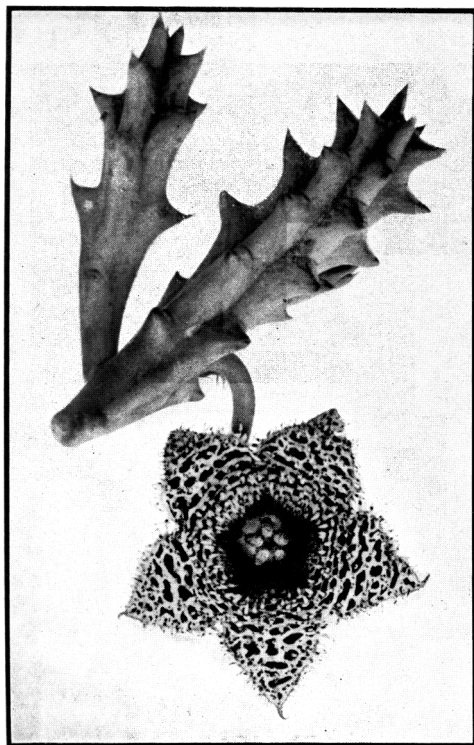


FIG. 942

Huernia bystrix N. E. Brown x 1.

From Barberton, Transvaal.

Photo: G. W. Reynolds, Johannesburg.

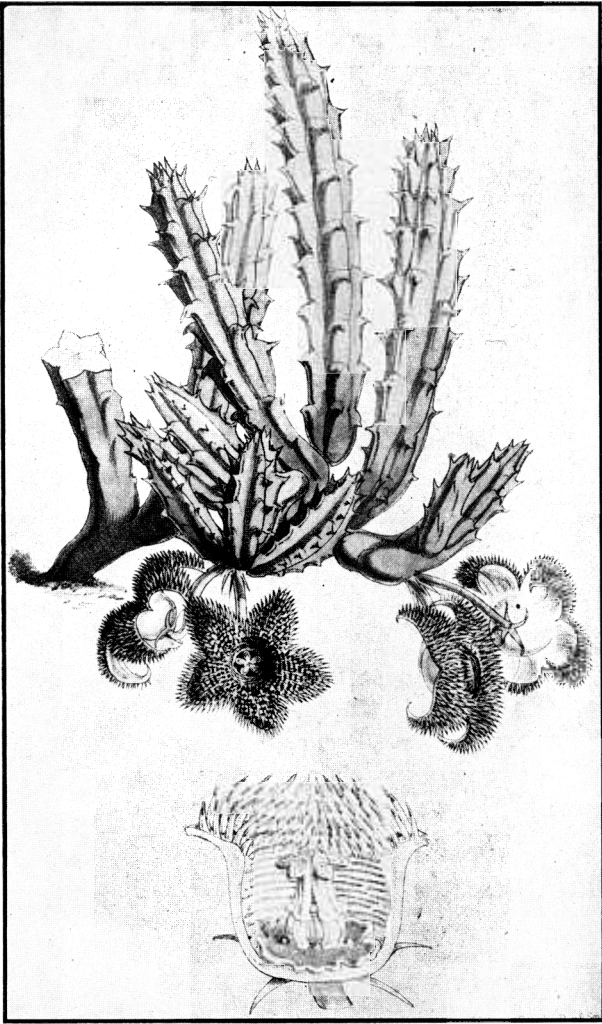


FIG. 943
Huernia hystrix N. E. Brow

Drawing by W. H. Fitch in C.
 Botanical Magazine, 1869.

There are considerable variations in the size of the flowers, with marked differences in the shapes of the corolla-lobes, which are sometimes short and broad at the base, or long and narrow. But the main differences are found in the color and shape of the outer corona-lobes. Their color varies from light yellow or white, through dark red, to almost complete black. The lightest shades occur in the flowers of plants from the Transvaal. The shape of the outer corona varies from nearly circular to a more frequent distinctly lobed pattern. Our collaborator, Mr. Reynolds, has sent us photographs showing variations occurring in

flowers from plants all collected in a small area at Hyslops Creek in the Barberton district, Transvaal, by J. Thornicroft. Fig. 940 shows a flower with the outer corona 9 mm. in diameter, almost circular, the lobes being scarcely visible, edged purple; Fig. 945 has the outer corona only 5 mm. in diameter, almost circular but finely toothed, also edged purple; while Fig. 942 has the outer corona divided into clearly defined lobes, the diameter 8 mm., the lobes 2 mm. long and 2.5 mm. across the flat apex, which is finely toothed and purple tipped. *Huernia hystrix* ranks among the strangest and most fascinating of all Stapeliads, and

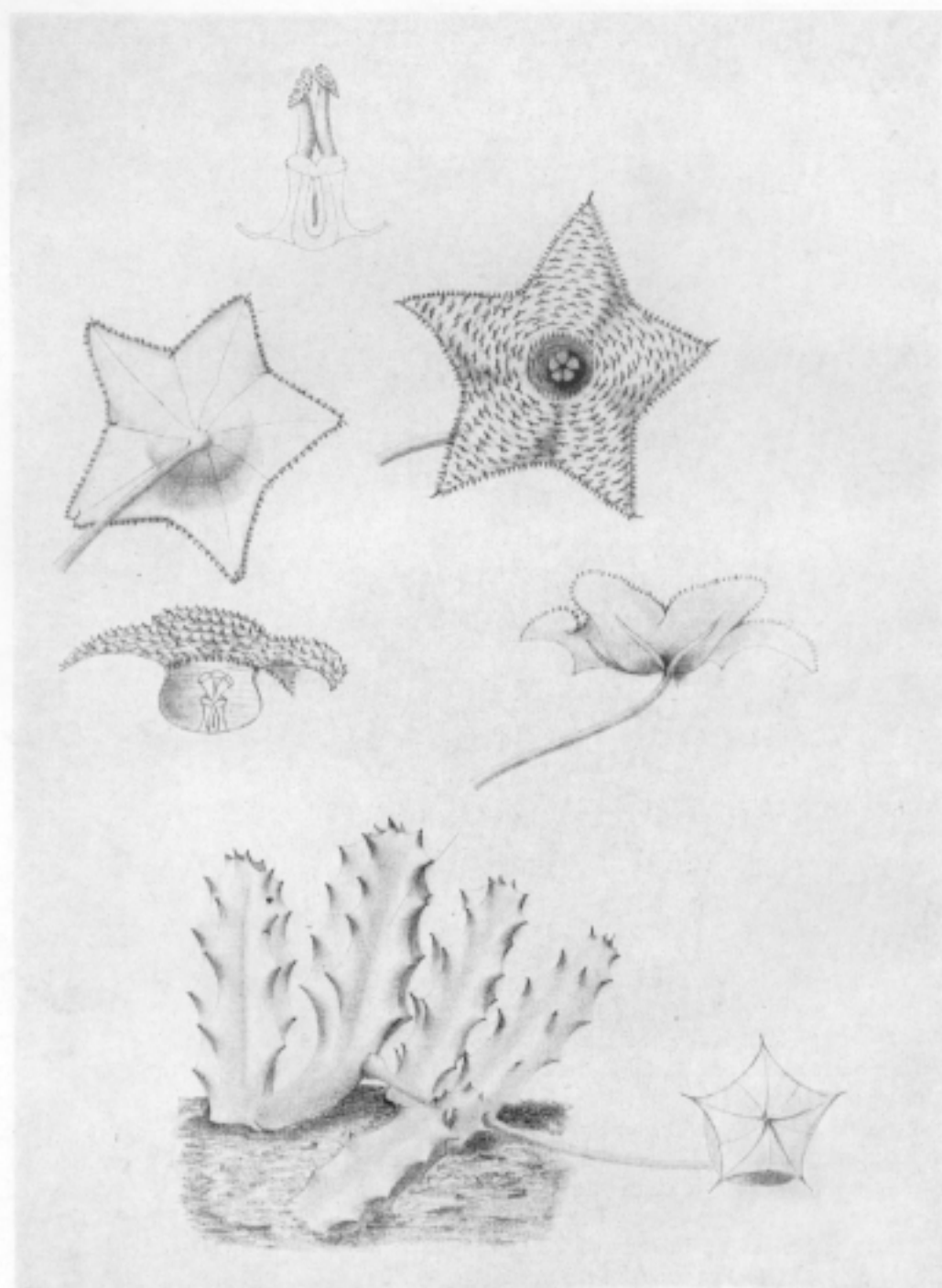


FIG. 944

Huernia bystrix N. E. Brown x 1.

Drawing by Prof. Antonio de Figueiredo Goenés e Sousa, from a plant growing at Mangulane, Portuguese East Africa.

we may look forward to learning more of its distribution and habits. It was first sent to the Royal Botanic Gardens, Kew, by M.

J. McKen of Durban sometime prior to 1869.

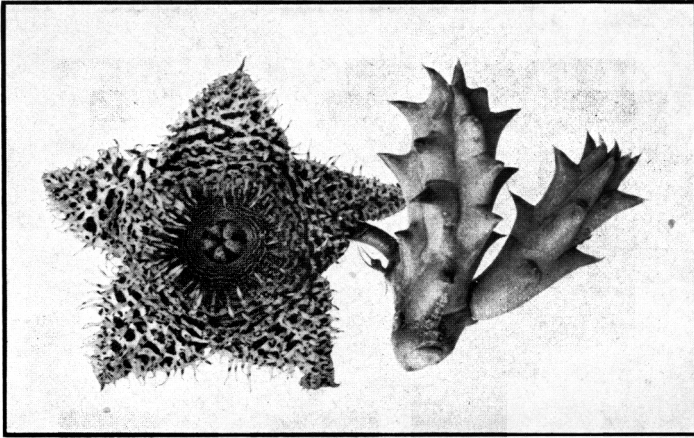


FIG. 945

Huernia hystrix N. E. Brown x 1.

From Barberton, Transvaal. Photo: G. W. Reynolds, Johannesburg.

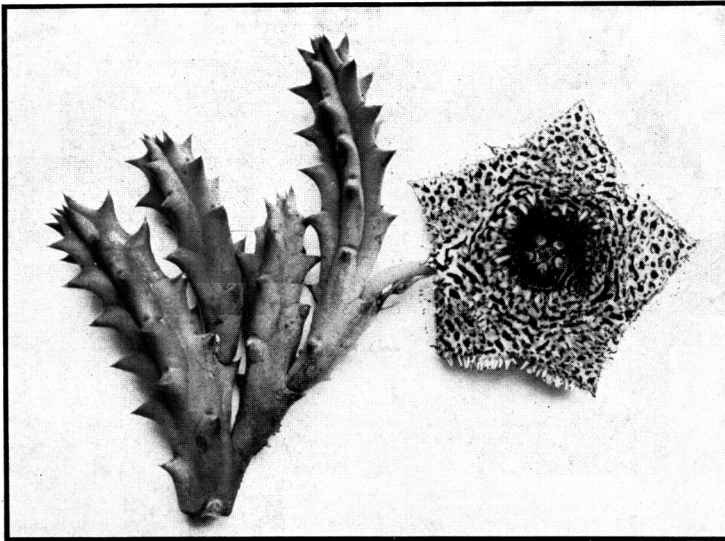


FIG. 946

Huernia hystrix N. E. Brown x 1.

From Mudén Valley, Natal. Photo: G. W. Reynolds, Johannesburg.

Huernia hystrix

Var. a. *Huernia hystrix* var. *appendiculata* (Berger), comb. nov.

Huernia appendiculata Berger, Stap. und Klein., 174. 1910.

The stems are described as more procumbent than those of *H. hystrix*, shorter, darker and with stronger teeth, broader at the base and more spiny at the tips; the flowers have the *corolla-lobes* broader than they are long, the ground color sulphur-yellow, the markings larger and less regular, the papillae also less regular in position and markings, their shape more subulate; the *outer corona-lobes* are shorter, indistinctly crenate, pale rose; the *inner corona-lobes* are erect, connivent, tipped with a projecting pendant appendage, light yellow, finely dotted with red.

This variety has hitherto been regarded as a distinct species; but we have found within the type modifications alike in stem form and flower form quite as pronounced as those attributed to the variety, with the single exception of the unique appendages terminating the inner corona-lobes. Berger

tells us that in one set of flowers he found the inner corona not so much as described, but conforming rather to the type of *H. hystrix*. If this detail of the pendant appendages to the inner corona-lobes is not constant, there can certainly not be two species involved. So, until Berger's plant is rediscovered, we prefer to consider it as a variety. The history of the variety is as mysterious as the character of its flowers. Berger says it was introduced by the firm of Dammann and Co. about 1898. It was thought to have been received from Eritrea, through Prof. Schweinfurth. This would be 2,000 miles from the habitat of the type, so it is probable some error has been made in the records. Berger later received a plant from Mt. Bomule, near Amani, Tanganyika, which he believed might also represent the var. *appendiculata*.

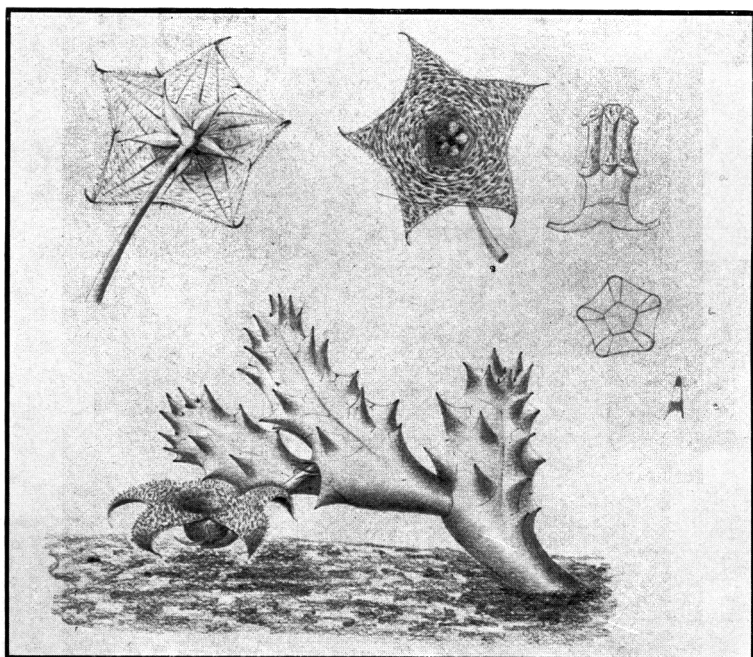


FIG. 947

Huernia hystrix
N. E. Brown x 1.

Drawing by Antonio de Figueiredo Gomes e Souza of a small-flowered plant from Panda, Inhambane district, Portuguese East Africa.

20. *Huernia stapelioides* Schlechter, Engler: Jahrb., xx. Beibl. 51. 1895.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 922):

Stems: erect, about $1\frac{1}{2}$ in. long and $\frac{1}{2}$ in. thick, 4-angled, with spreading tubercles, glabrous;

Flowers: few, in extra-axillary fascicles;

*Pedice*l: up to $\frac{1}{2}$ in. long, glabrous;

Sepals: $3\frac{1}{2}$ lin. long, linear, very acute, glabrous;

Corolla: subrotate, scarcely $1\frac{1}{4}$ in. in diameter, glabrous outside, densely verrucose within; *tube* depressed; *lobes* triangular, very acute;

Outer corona: lobes divaricate, subquadrate, obtusely emarginate at the apex;

Inner corona: lobes filiform, thickened and verrucose at the reflexed apex, much overtopping the style-apex.

Type locality: Transvaal: Pietersburg Distr.: near Nazareth, between the Woodbush Mountains and Klipdam, at 4500 feet elevation.

Distribution: Not further known.

Hitherto an imperfectly known species, discovered by Dr. R. Schlechter in the northern Transvaal, Feb. 13, 1894. Dr. Schlechter christened it the "Stapelia-like *Huernia*," because he considered the papillate inner corolla surface of the flowers akin to that of *Stapelia verrucosa*. The color is given as brownish on the inner face, paler outside. The corolla is described as broadly bell-shaped, subrotate, with minute

intermediate teeth, and Berger stated that its flat appearance separated it from all other *Huernias*.

While our book was in the printer's hands, however, Miss Obermeijer has written us that she believes *H. stapelioides* to be identical with *H. vogtsii*, and such details as the very small *Huernia* points, the papillate corolla and the character of the inner corona-lobes all lend color to her very

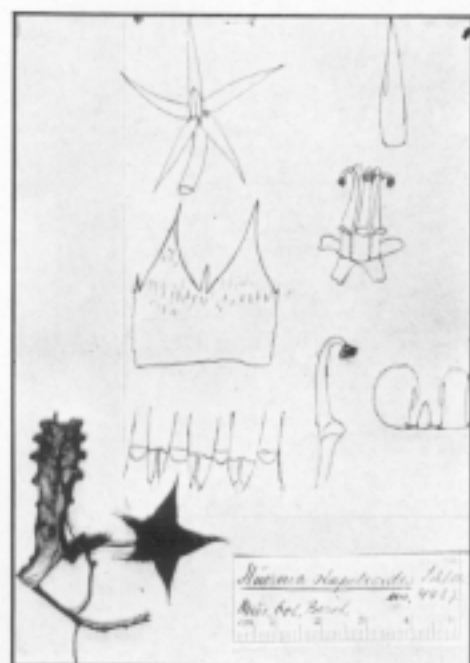


FIG. 948-A

Corona of *Huernia vogtsii* Phillips, with an inner corona-lobe.

From a dissection by Miss Cythna Letty in the Flowering Plants of South Africa, 1932.

FIG. 948

Huernia stapelioides Schlechter

From a photograph of the type specimen in the Herbarium of the Berlin-Dahlem Botanic Museum.

interesting diagnosis. The habitats of the two plants also agree, leaving only the corolla-tube of *H. vogtsii* to be accounted for, and this contradiction with the description of *H. stapelioides* may have been an oversight on the part of Dr. Schlechter.

Miss Obermeijer's diagnosis receives full confirmation from Dr. E. Werdermann, Curator of the Berlin-Dahlem Botanic Museum, where the type of *H. stapelioides* is preserved. Dr. Werdermann writes:

"The specimens of *H. vogtsii* submitted by Miss Obermeijer agree with Schlechter's type of *H. stapelioides*, which has much more marked papillate processes on the inner surface of the corolla than Schlechter's description indicates." This verdict subordinates the name, *H. vogtsii*, to the status of a synonym, and requires the substitution by the reader of the name, *H. stapelioides*, in its stead throughout our book.

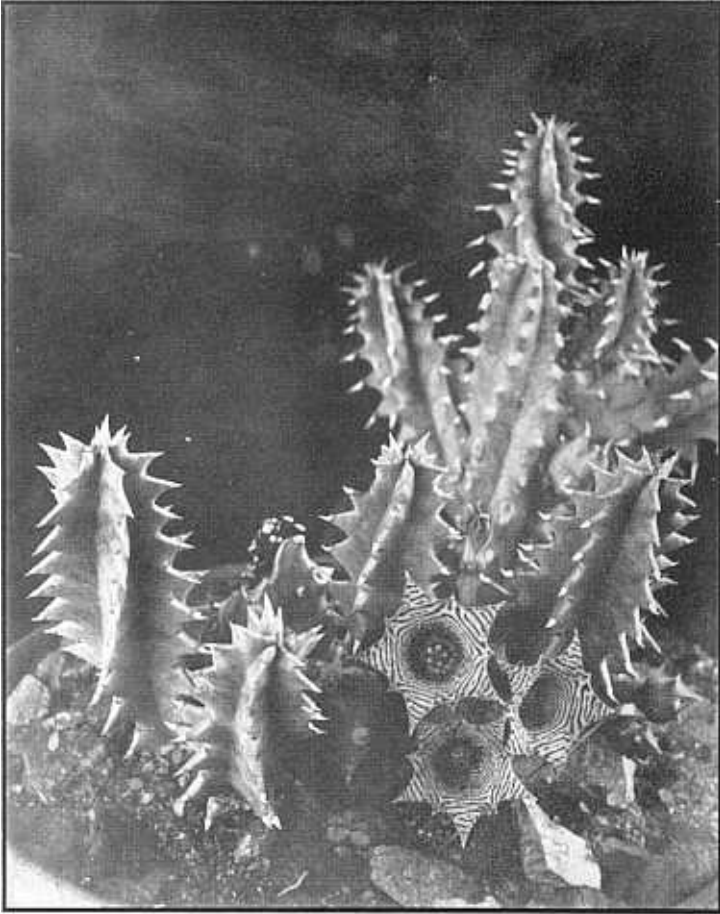


FIG. 949

Huernia vogtsii Phillips x 0.75

Photo by T. N. Leslie. (Plant with 5-angled stems)

***Huernia vogtsii* Phillips, Flow. Pl. So. Afr., t. 452. 1932.**

(Description by Dr. E. P. Phillips, l.c.):

Stems: branched; branches 4 to 9 cm. long, 12 to 20 mm. broad, 4-angled, with the angles acute and bearing prominent conical teeth; teeth semi-pungent when young, tipped with a pale callus when older;

Flowers: several together, developing successively,

*Pedice*l: 1.5 cm. long, terete, glabrous;

Sepals: 9 mm. long, linear, acuminate;

Corolla: 3.7 cm. in diameter, pale yellow with longitudinal maroon markings; *tube* 5 mm. long, 9 mm. in diameter, minutely punctate without, with bands of maroon-colored markings within and glabrous at the base, densely papillate on the upper portion; *lobes* 1.5 cm. long, 1 cm. broad at the base, ovate, acuminate, acute, densely papillate, papillae usually pale yellow on lower half, maroon-colored on upper half;

Outer corona: dark maroon-colored, distinctly visible against a lighter reddish background at the base of the tube; lobes 1.75 mm. long, 1.5 mm. broad, quadrate, almost truncate;

Inner corona: lobes 4 mm. long, flattened, with a distinct crest about the level of the staminal column, swollen and glandular-papillose on the swollen portion.

Type locality: Transvaal: Pretoria Distr.: Crocodile Poort.

Distribution: Also in Pretoria Distr.: Namagalies Kraal, near Brits; Lydenburg Distr. Sekukuniland; Waterberg Distr.: Visgat, near Naboomspruit; Pietersburg Distr.: or several farms, as far north as Bethesda No. 2, practically on the tropic; Swaziland near Stegi in the Ubombo range.

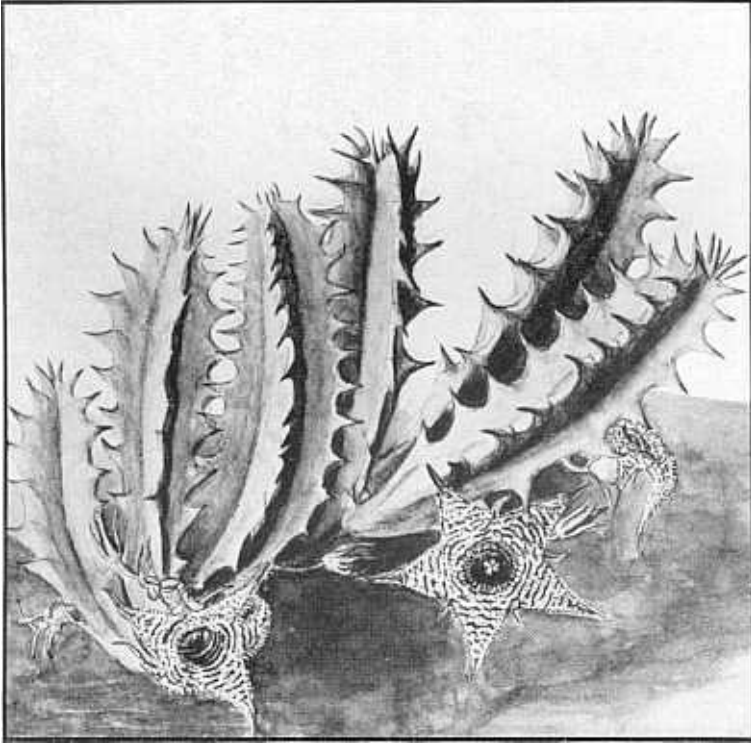


FIG. 950

Huernia vogtsii Phillips x 0.8

From the original water color drawing by Miss Cythna Letty for the *Flowering Plants of South Africa*, 1932.

This interesting species is named for its discoverer, L. R. Vogts of Waterkloof near Pretoria, who collected it on the open veld near Crocodile Poort in the Magaliesberg Range, where it was growing in association with *Huernia transvaalensis*. It has been recorded from a number of stations from the tropical portion of the Transvaal south to Swaziland. It adapts itself readily to different habitats, for besides growing in open veld it has been found between stones

on rocky ridges, on sandy soil in eroded water courses and on alluvial soil under the "noem-noems" (shiny leaved thorny bushes growing to about 5 feet high). Doubtless at many points it has been entirely overlooked, for it may easily be confused with *H. loeseneriana* and *H. bystrix*.

The stems usually have four angles, like those of *H. loeseneriana*, but occasional plants are seen with 5-angled stems. The flowers differ from those of *H. loeseneri-*

ana, according to the author, "in the corolla being much more densely papillate, in the longer and more acuminate corolla-lobes, in the outer corona-lobes being truncate and not rounded at the apex, and in the inner corona-lobes being quite 1 mm. longer and extending further beyond the staminal column. In cultivation it becomes a strong, sturdy plant and flowers profusely."

The general resemblance between *H. vogtsii* and *H. hystrix* suggests a common ancestry. J. F. Kirsten has sent us a very interesting comparison of the two. He says: "*Hystrix* is a big, handsome flower, but inclined to be a little untidy, while *vogtsii* is a neat small flower, with proportions geometrically almost perfect. The texture is also different. *Vogtsii* has a smooth, thin-fleshed bud, whereas the bud of *hystrix* is inclined to be less smoothly moulded. *Hystrix* is shaggy, the rough processes of the corolla are the shaggiest I have seen; in *vogtsii* the processes are quite neat and systematic. There is all the difference between a Shetland pony and a Clydesdale. And the roughness of the corolla seems to affect the character of the color markings. In my *hystrix* the markings are vague, without definite margins, and thus merge into the background. *Vogtsii*, on the other hand, is very neat in its markings. *Hystrix* carries its blossoms on long pedicels; *vogtsii* demurely hides its blooms on tiny stems, rarely more than a quarter of an inch long, so that they are quite difficult to see.

"As to the plants themselves, *hystrix* grows fairly loosely, with its stems remaining greenish even in winter. When the summer rains come and the plants become really fat, with the stems as plump as they can ever be, the angles still remain deep and well defined. I have never seen the stems other than 5-angled, the angles often having a helical twist. *Vogtsii*, on the contrary, is a squat little plant, growing in compact clumps. With the approach of winter its stems assume a mottled mauve-

blue color, very distinct from the winter grey-green of *hystrix*. With the rains, the stems of *vogtsii* become almost square, and it is unusual for them to be anything but 4-angled. As the stems become older, the rudimentary leaves become less and less pointed, and finally wither away completely."

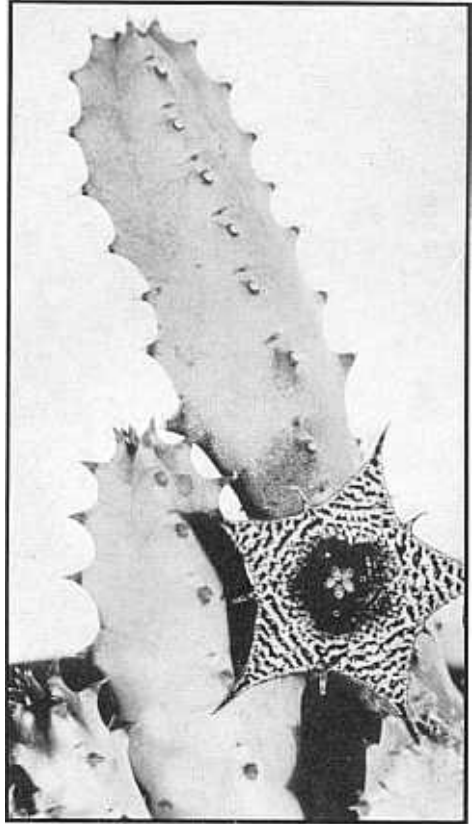


FIG. 951

Huernia vogtsii Phillips x 1.25

The corona forms of the two species furnish an interesting comparison. The inner corona-lobes of *H. vogtsii* have a distinct dorsal ridge or crest, about at the level of the top of the staminal column, which is virtually identical with the transverse dorsal thickening of the inner corona-lobes found in *H. hystrix*. But the tips of the inner corona-lobes are simply clavate in the type form of *H. vogtsii*, and contrast

markedly with the "inverted foot" or *Podostelma* pattern of *H. bystrix*. We have a plant of *H. vogtsii*, however, grown in the collection of David Pringle in Port Elizabeth, in which the tips of the inner corona-lobes have the "inverted foot" pattern and exactly conform in this respect with *H. bystrix*. Undoubtedly the two species hybridize, and almost as certainly they derive from a common ancestry.

The outer corona-lobes, in the type of *H. vogtsii*, are quadrate, almost truncate; in some flowers we have found them broadly emarginate, closely resembling the *bystrix* pattern.

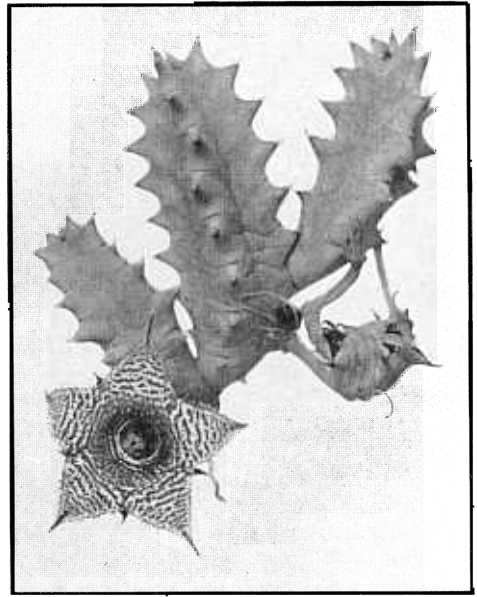


FIG. 952

A weak form of *Huernia vogtsii*, with distinct leanings towards *H. bystrix*, possibly a cross between the two species. Photo: G. W. Reynolds, of a plant from near Chunespoort, Pietersburg district.

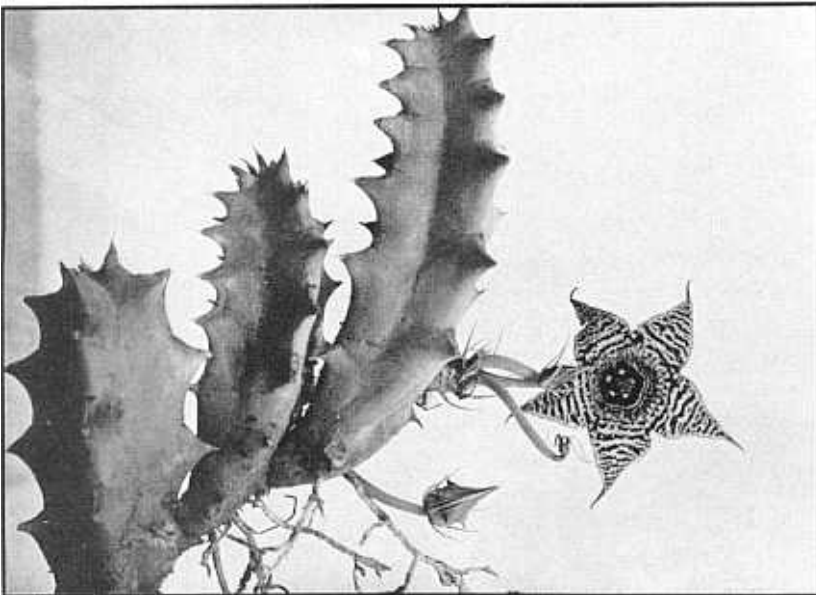


FIG. 953

Huernia vogtsii Phillips x 0.8
from Pretoria district. Photo: G. W. Reynolds, Johannesburg.

21. *Huernia loeseneriana* Schlechter, Engler: Jahrb., xx. Beibl. 51. 1895.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 911):

Stems: erect or ascending, 1 to 2½ in. long, acutely 4-angled, ½ to ¾ in. square, green, purple-tinted at the tips; teeth deltoid, acute, 1 to 1½ lin. long;

Flowers: 1 to 2 together, near the base of the young stems;

Pedicel: 2 to 3 lin. (up to ½ in., *Schlechter*) long;

Sepals: ¼ in. (⅛ in., *Schlechter*) long, subulate from an ovate base;

Corolla: campanulate, with the tube widening upwards and gradually passing into the spreading lobes, scarcely 1 in. in diameter (about ⅔ in. long and nearly ½ in. in diameter, verrucose and brownish within, paler outside, *Schlechter*), very minutely asperate and brownish-purple outside, covered inside from the middle of the tube nearly to the tips of the lobes with short stiff compressed-conical obtuse processes, dull yellow, covered with very crowded narrow broken transverse lines and spots of dull brownish-crimson, and entirely of that color at the base of the tube, but darker; *tube* ⅓ in. long; *lobes* ¼ in. long and rather more in breadth at the base, broadly deltoid, very acute;

Outer corona: lobes about ¾ lin. long and broad, subquadrate, subtruncate at the apex, black, with a velvet-like surface;

Inner corona: lobes 1 to 1¼ lin. long, connivent-erect with diverging tips, much exceeding the anthers, linear-subulate, thickened and knob-like at the minutely scabrous apex, with a transverse ridge at the base, dull purplish-red, brownish at the tips.

Type locality: Transvaal: near the Olifants River, at 5000 feet elevation.

Distribution: Also common in Pretoria Distr.: Riviera; Gezina; etc.; Belfast Distr.: Waterval Onder; Potgietersrust Distr.: near Potgietersrust; Middelburg Distr.: near Witbank.

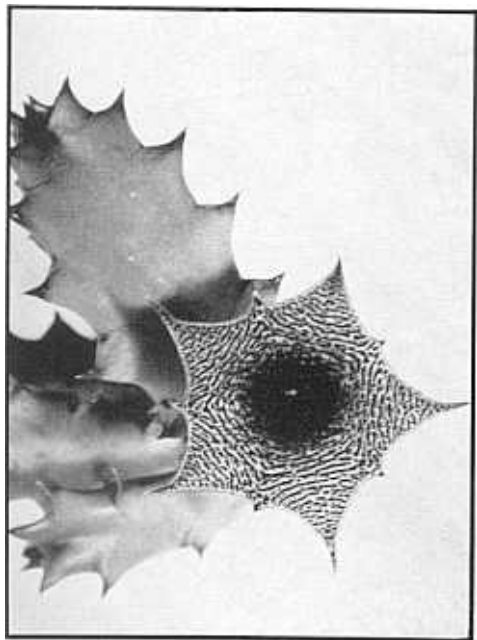


FIG. 954

Huernia loeseneriana Schlechter x

"Loesener's *Huernia*" is related to *H. longituba*, but the stems can be distinguished, as they are always 4-angled. The flowers are smaller, the inner surface of the corolla dull yellow with crowded narrow lines and spots of dull brownish-crimson, the tube shorter and its base darker. In *H. longituba* the markings are confined to spots. Both species are noteworthy for the short stiff conical processes which cover the entire inner face of the corolla from the middle of the tube nearly to the tips of the lobes. Discovered by Dr. R. Schlechter in the Transvaal in October, 1893, and named by him for his friend Dr. Ludwig Eduard Theodor Loesener (born in 1865), a German botanist whose researches at the Frederic-William University in Berlin on the Holly and other families have been widely published.

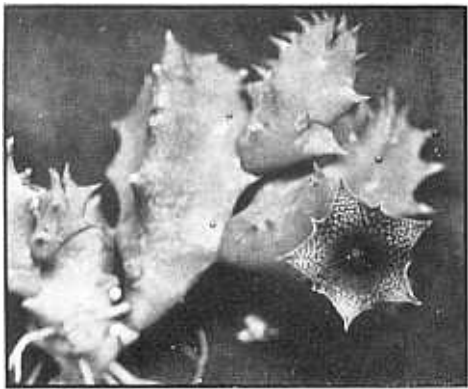


FIG. 955

Huernia loeseneriana Schlechter x 0.9
Photo by S. Tapscott.

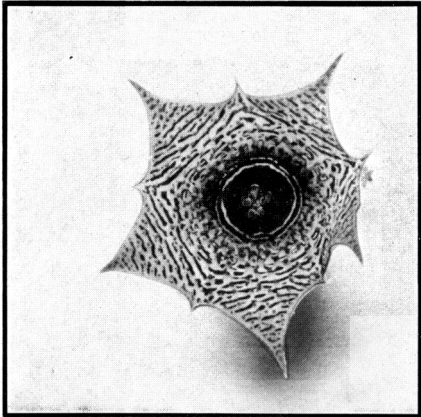


FIG. 956

Huernia loeseneriana Schlechter x 1.5

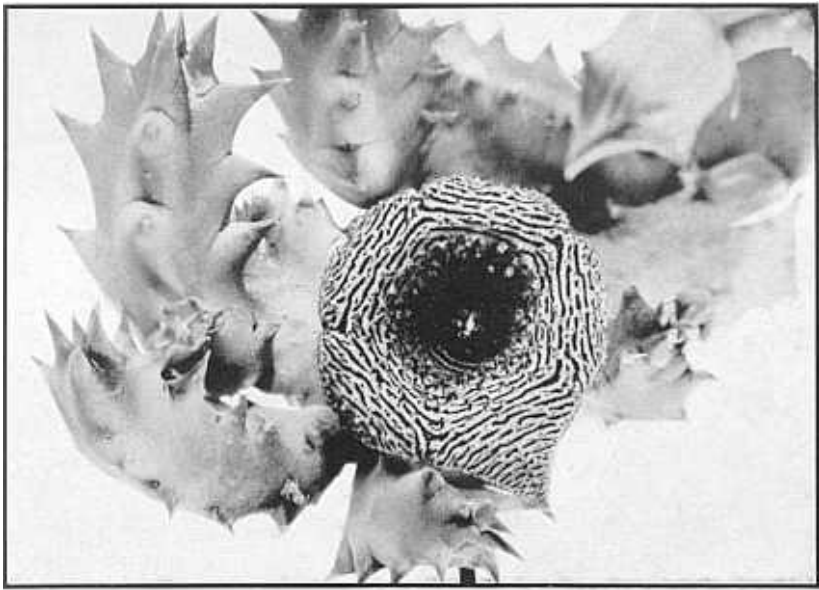


FIG. 957

Huernia loeseneriana Schlechter x 2.

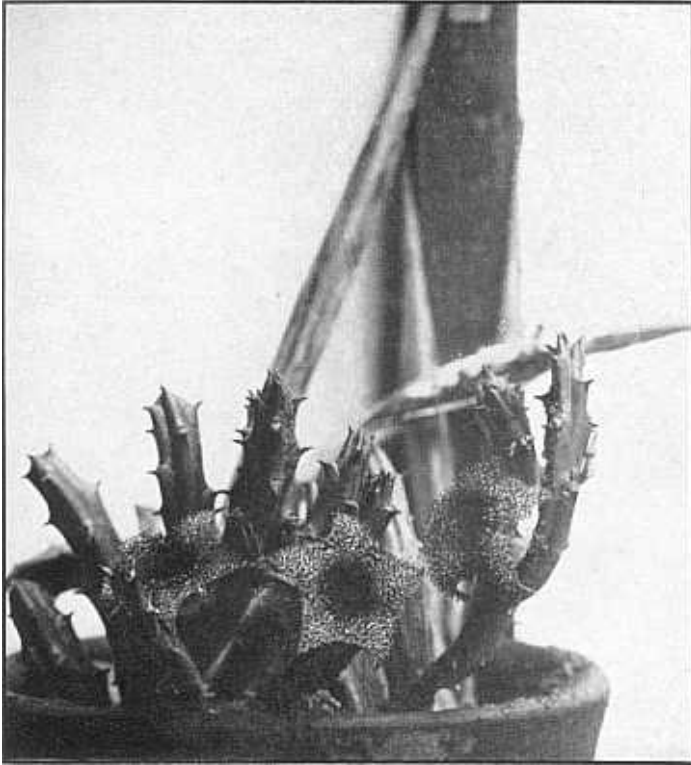


FIG. 958

Huernia volkartii Gossweiler x 1

Photo by J. Gossweiler.

22. *Huernia volkartii* Gossweiler, sp. nov.

(Description by John Gossweiler):

Notis floralibus species nova in altiplanitie Angolae lecta cum *H. vogtsii*, quae intervallo 3,000 kil. remota in Transvaalia crescit, assimilatur. Speciei utriusque corollae facies interna lineis badiis confertis insignitur, tubo basi glabro, lobisque papillis luteo-albicantibus apice purpureis dense obtectis. *H. volkartii* autem distinguitur floribus minoribus, tubo pro ratione valde latiori, coronae exterioris lobis arcte lanceolatis acuminatisque.

Stems: procumbent-ascending from a tufted base, spreading, 4 to 5-angled, dusky purplish;

Flowers: 1 to 3 in subsessile cymes, successively developed; cymes appearing alike near the base of old and quite young stems, frequently bracteate; bracts up to $\frac{1}{4}$ in. long, subulate, dull red-purplish;

Pedicel: dull red-purplish;

Sepals: 4 lin. long, subulate, faintly carinate on the back, flat on the upper face, closely appressed to the corolla-tube, lurid purplish;

Corolla: in bud with the lobes twisted and the tube pentagonal, owing to the narrowly acuminate patently spreading intermediate "Huernia points" of the corolla; when fully expanded, *tube* suburceolate, *lobes* spreading with reflexed acuminate tips; outside tube scabrid-tuberculate, lobes prominently 3-nerved and of lurid purplish coloration; inside tube smooth with dusky crimson transverse markings on a dull creamy-white ground; lobes densely covered with creamy white papillae of about 1 lin. in length or a little more, tipped and girdled with dusky crimson markings;

Outer corona: lobes 2 lin. long by about $1\frac{1}{3}$ lin. broad, prostrate, narrowly linear, black, fleshy, appressed to the base of the corolla-tube;

Inner corona: lobes erect, horn-shaped, entire, connivent at the middle, but diverging from one another at their obtuse microscopically tuberculate apex, 2 lin. long, blackish-crimson with a broad transversal base; not flattened and with no dorsal crest;

Follicles: narrow, up to 3 in. long by $\frac{1}{8}$ in. in diameter; seed compressed ovate-marginate, terminating in a setose pappus.

Type locality: Angola: Vila Nova de Seles, in the Cuanza Sul country, at 4,500 feet elevation.

Distribution: Not further known.

"Volkart's *Huernia*" was discovered some years ago by John Gossweiler, growing in narrow crevices of granite boulders at Vila Nova de Seles, on the high plateau of Angola. Mr. Gossweiler dedicated the plant to his friend, now deceased, George Volkart of Winterthur, Switzerland.

It is a spreading tufted plant with characteristic slender stems only $\frac{1}{3}$ inch thick. The plant is very closely related to *Huernia vogtsii* and it might seem proper to consider it as a variety of that species, save for the great distance, over 2,000 miles, between their respective habitats in the Cuanza Sul country of Angola and in the Transvaal and Swaziland. No specimens intermediate in location have been recorded. The flowers of *H. volkartii* are smaller than those of *H. vogtsii*. One received in formalin was only 1.6 cm. in diameter, the tube proportionately larger than in *H. vogtsii*. The shape of the outer corona-lobes is also different, narrowly lanceolate and acutely pointed, instead of quadrate, almost truncate, as it is in *H. vogtsii*. In other characters the two species are markedly similar. In particular the papillae, very pale colored with a dark red

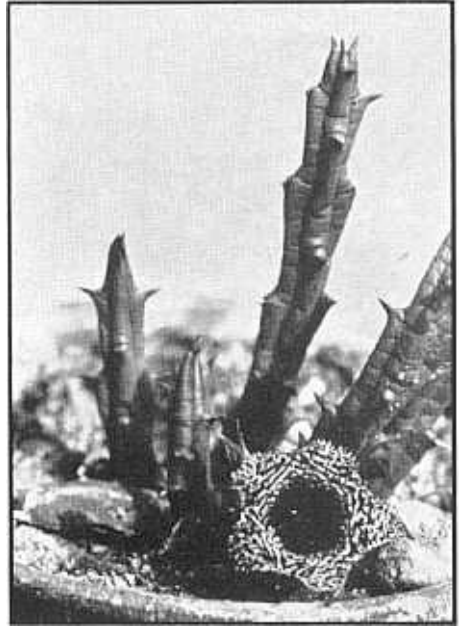


FIG. 959

Huernia volkartii Gossweiler x 1.

Photo by F. Wiedemann.

apical cell, point to a close relationship. It should be recalled that very similar papillae are found also in *H. bystrix* and other *Huernias*, and in the two strange species of *Stapelianthus* from Madagascar.

23. *Huernia somalica* N. E. Brown, Kew Bull., 309. 1898.

(Description by Dr. Brown, Flora Trop. Afr., iv. i. 497):

Stems: 5-angled, light green, glabrous, scarcely glaucous, $2\frac{1}{2}$ to 3 in. high, 7 lin. thick, exclusive of the 3 to $3\frac{1}{2}$ lin. long stout conical very acute teeth at the angles;

Flowers: from the base of the young stems;

*Pedice*l: 3 to 4 lin. long, $\frac{3}{4}$ lin. thick, glabrous;

Sepals: 3 lin. long, $\frac{3}{4}$ lin. broad at the base, subulate-acuminate, glabrous;

Corolla: 1 to $1\frac{1}{3}$ in. in diameter, smooth and glabrous outside and within the tube, inside papillate on the lobes and the limb just at their base, dull purple or port-wine color, the lobes and some mottling on the convex part of the limb dull ochreous; *tube* $3\frac{1}{2}$ to 4 lin. long, 6 lin. in diameter, campanulate; *limb* convex or recurving, with 5 distant, deltoid, very acute spreading lobes 3 lin. long, 2 to $2\frac{1}{2}$ lin. broad, and 5 small teeth alternating with them;

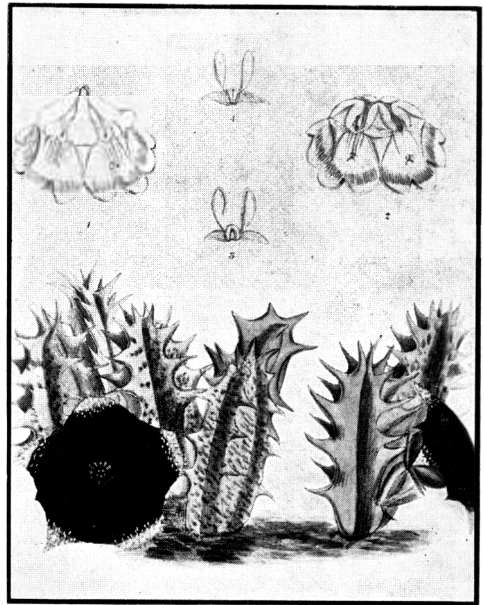
Outer corona: lobes $\frac{3}{4}$ lin. long, 1 lin. broad, subquadrate, bifid to half-way down, appressed to the bottom of the corolla, dark blood-red, glabrous;

Inner corona: lobes 1 lin. long, subulate, exceeding the anthers, ascending and connivent over the apex of the style, bright yellow, margined with dull purple in their upper part, glabrous.

Type locality: British Somaliland, without locality.

Distribution: Not further known.

This "Somali *Huernia*" is the second species of *Huernia* sent from British Somaliland to the Botanic Garden at Cambridge, England, by Mrs. Lort-Phillips about 1896. The disk of the corolla around the central tube is convex in shape and somewhat thickened in texture, producing the effect of a real annulus, without perhaps actually being one. The bright yellow inner coronalobes shine conspicuously like five little points of light at the bottom of the dark corolla-tube. The plant is a very curious one, not only for its flowers, but because of the very acutely toothed stems. It is a pity that it is no longer in cultivation.



24. *Huernia praestans* N. E. Brown, Flora Cap., iv. i. 914. 1909.

(Description by Dr. Brown, l.c.):

Stems: erect or ascending, 1 to 2 in. long, about $\frac{1}{2}$ in. thick including the teeth, acutely 4-angled, glabrous, deep green (slate-colored, *Pillans*) mottled with purple; teeth $1\frac{1}{2}$ to 2 lin. long, spreading, acute, slightly recurved at the tips;

Flowers: from near the base of the young stems;

*Pedice*l: short, glabrous;

Sepals: 3 to $3\frac{1}{2}$ lin. long, narrowly lanceolate-attenuate, glabrous;

Corolla: apparently somewhat turbinate and flat- or broad-topped when in bud, with a short acute point; when expanded about $1\frac{1}{2}$ in. in diameter; *tube* campanulate, about $\frac{1}{4}$ in. long and $\frac{1}{2}$ in. in diameter outside; *limb* abruptly and horizontally spreading from the tube, convex and ring-like around its pentagonal mouth; *lobes* slightly ascending and recurved, about $\frac{1}{2}$ in. long and rather more in breadth, deltoid, acute; outside glabrous and smooth, creamy, tinted with purplish and marked with purple veins and spots; inside densely and very minutely papillate on the lobes, with stiffly erect stout clavate dark purple hairs $\frac{1}{4}$ to $\frac{1}{2}$ lin. long seated on stout conical creamy papillae covering the disk or annulus and extending in 5 triangular areas down to about the middle of the tube; *lobes* greenish-yellow, marked with impressed purple dots and densely dusted with purple, with the inside of the tube and the disk around its mouth creamy, thickly marked with dull purple spots, much larger than those on the lobes and more or less confluent into rather crowded irregular lines in the tube, the base of which is entirely dark purple and shining;

Outer corona: 5-lobed, with a small obtuse tooth alternating with the lobes, black; lobes $\frac{1}{2}$ lin. long, 1 lin. broad, transversely oblong, emarginate;

Inner corona: lobes subulate, $1\frac{1}{2}$ lin. long, somewhat connivent-erect at the lower half, with diverging tips, dark purple-brown, not nearly reaching to the mouth of the tube.

Type locality: Cape Prov.: Laingsburg Distr.: near Witte Poort, between Laingsburg and Ladismith.

Distribution: Also in Riversdale Distr.: Muiskraal; Ladismith Distr.: near Ladismith.

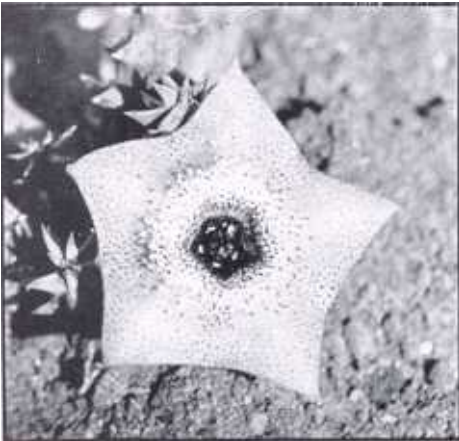


FIG. 961

Huernia praestans N. E. Brown x 1.25

From the collection of David Pringle.

This species, with its showy flowers, was well christened "the pre-eminent *Huernia*." It was discovered by N. S. Pillans in the extreme West of the Great Karroo region. The flowers are greenish-yellow inside, with purple dots, the tube and annulus creamy with larger spots, becoming entirely dark purple at the bottom of the tube. The upper half of the tube and the annulus are covered with stiff clavate purple hairs, seated on stout creamy papillae, the lobes minutely papillate.

25. *Huernia guttata* (Masson) R. Brown, Mem. Wern. Soc., i. 22. 1811.

Stapelia guttata Masson, Stap. Nov., 10. 1796.

Stapelia lentiginosa Curtis, Bot. Mag., t. 505. 1801.

Stapelia venusta Jacquin, Stap., t. 7, (var. *minor*, t. 64:4). 1806-19. Nec Masson, 1796.

Huernia lentiginosa Haworth, Syn. Pl. Succ., 29. 1812.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 918):

Plant: 2 to 3 in. high; *stems* erect, $\frac{1}{2}$ to $\frac{3}{4}$ in. thick, acutely 4 to 5-angled, glabrous, green, glaucous?; angles with acute deltoid slightly recurved teeth 1 to $1\frac{1}{2}$ lin. long;

Flowers: 1 to 5 together near the base of the young stems, developing successively;

*Pedice*l: rather slender, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, glabrous;

Sepals: $2\frac{1}{2}$ to 3 lin. long, lanceolate-subulate, glabrous;

Corolla: flat-topped and 5-angled in bud, with 5 short (incurved?) teeth at the angles and 5 prominent ribs radiating from the short central point; $1\frac{1}{4}$ to $1\frac{1}{2}$ in. in diameter when expanded; *tube* campanulate or subglobose-campanulate, slightly constricted at the mouth; *limb* saucer-shaped, lobed to half-way, spreading very abruptly from the tube and raised into a very conspicuous broad convex *annulus* around its mouth, with ascending-spreading *lobes*, 4 to 5 lin. long and broad, deltoid, acuminate; outside smooth and glabrous; inner face with some scattered fleshy spine-like processes (not hairs) $\frac{1}{4}$ to $\frac{1}{2}$ lin. long at the throat of the tube and around its mouth upon the otherwise smooth annulus, minutely papillate on the rest of the limb and lobes, light yellow, dotted with crimson to the tips of the lobes;

Outer corona: divided into 5 pairs of narrow acute teeth nearly 1 lin. long, light pinkish or whitish with purple margins to the teeth and a blackish ring at the base around the staminal column, enlarging into 5 rounded spots opposite the pairs of teeth;

Inner corona: lobes about $1\frac{1}{2}$ lin. long, subulate, acute, connivent at the lower part over the style-apex, then rather abruptly spreading, with upcurved tips, apparently yellow.

Type locality: South Africa: without precise locality.

Distribution: Cape Prov.: Bushmanland; Clanwilliam Distr.; Van Rhynsdorp Distr.; ?Distr.: between Willowmore and Port Elizabeth; ?South West Africa: Barbi.

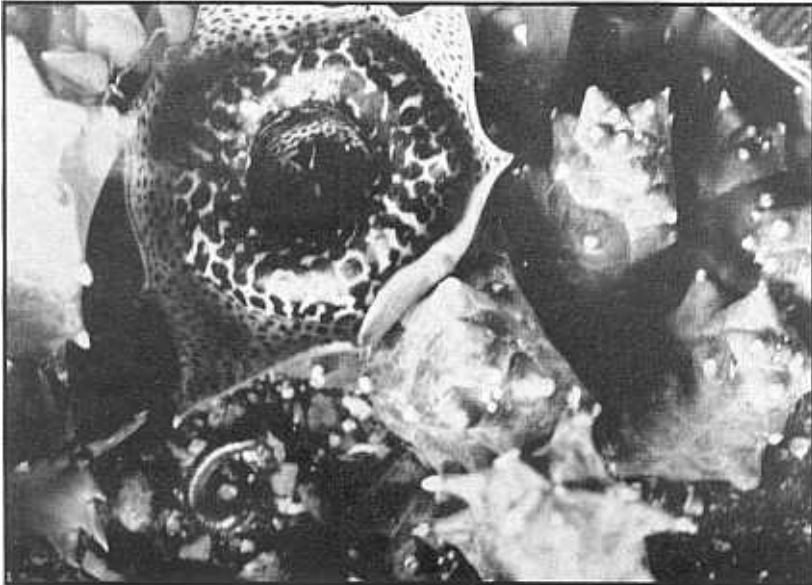


FIG. 962

Huernia guttata R. Brown x 2.

Photo by H. Herre.

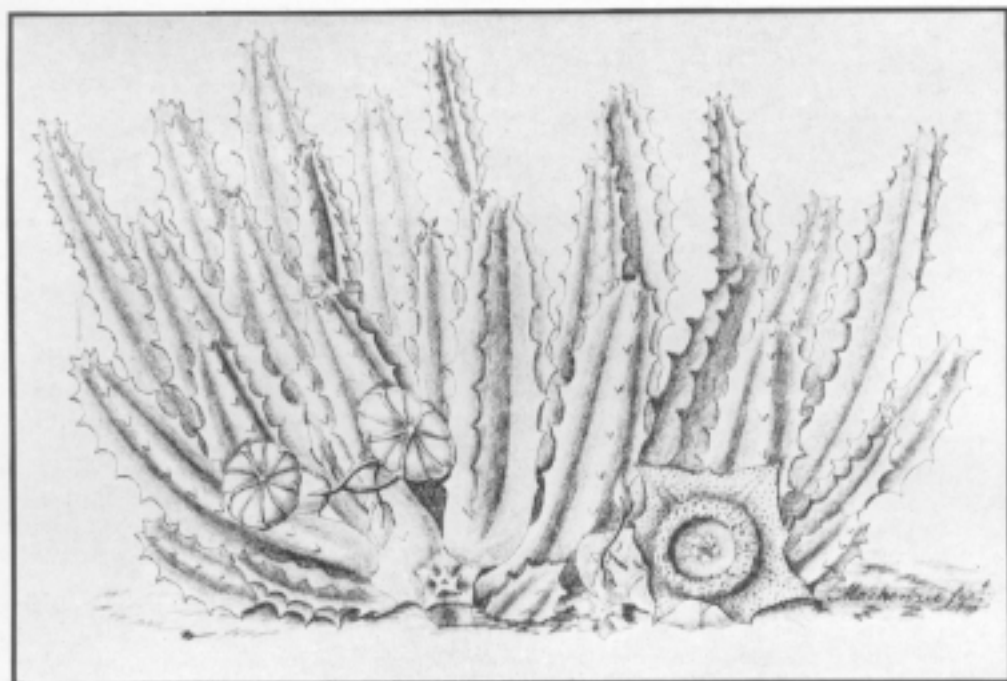


FIG. 963

Huernia guttata R. Brown x 0.8
From Masson: *Stapeliae Novae*, 1796.

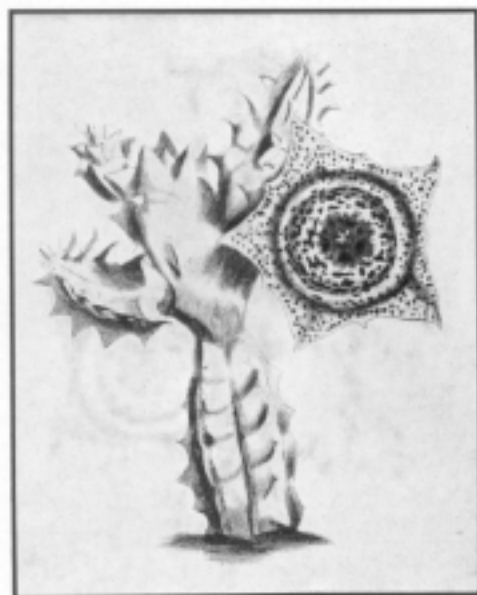


FIG. 964

Huernia guttata R. Brown x 0.8
From Curtis's *Botanical Magazine*, 1801.

The "speckled *Huernia*," or as William Curtis called it, believing he had identified a distinct species, the "freckled *Huernia*," was discovered by Francis Masson and then lost to cultivation for a century and a quarter. It has recently been rediscovered by Dr. G. C. Nel between Willowmore and Port Elizabeth, and appears to be widely distributed, for it has been reported also from Bushmanland and from the Clanwilliam and Van Rhynsdorp districts, and perhaps also from South West Africa. The stems of the plant resemble those of *Huernia venusta*. The $1\frac{1}{2}$ inch flowers are light yellow, finely dotted with crimson, with a campanulate tube and broad annulus. They are wholly hairless, but have some spine-like processes within the tube and on the annulus, and the rest of the corolla is minutely papillate.



FIG. 965

Huernia guttata R. Brown

Photo by W. Triebner of a plant from
Springbok, Little Namaqualand.
The identification is uncertain.

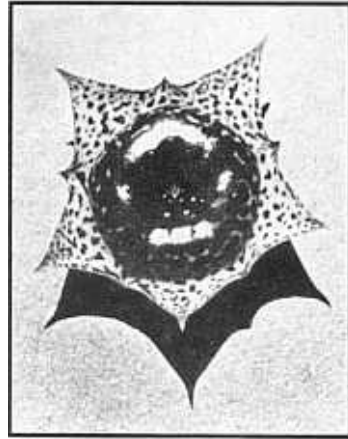


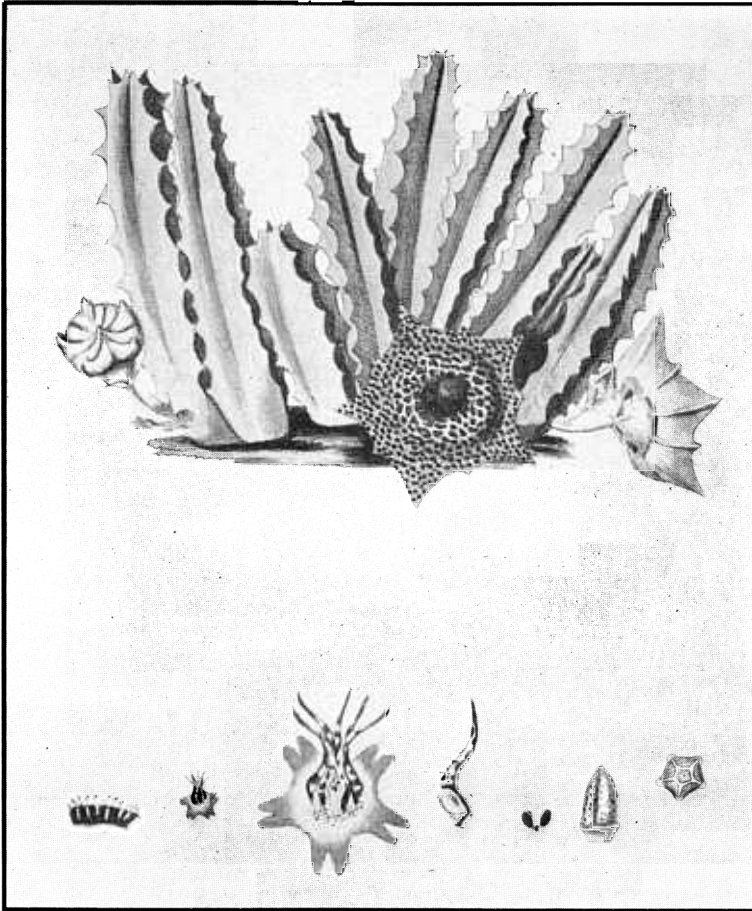
FIG. 965-A

Huernia guttata R. Brown x 0.7

Photo by Ernst Rusch, Jr., of a
flower from Barbi, South West
Africa. The identification is
uncertain.

In *H. guttata* the convex annulus is a very conspicuous object, and in the eight following species its usually smooth and often shiny fabric seems to grow more and more remarkable. These strange inflations of the corolla-disk have suggested to the sea-farer some resemblance to a Life-buoy; their peculiar colors have awakened in the epicure memories of raw liver; their refraction of light has proved the despair of the photographer; and their striking individuality may well spur the botanist one

day, as Mr. Lang has already suggested, to regroup the species into a new genus, where they would receive the joint acclaim they so fully merit. We are held back from attempting this generic change here, only by the fact that in other regards, and especially in the corona form, these plants are all such thoroughbred *Huernias*, and by the gradual sequence in which the annular swelling subsides in *H. praestans* and *H. somalica*, and finally vanishes altogether in the varieties of *H. brevirostris*.



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Huernia ocellata Schultes
Stapelia Descrip

***Huernia ocellata* (Jacquin) Schultes, Syst. Veg., vi. 9. 1820.**

Stapelia ocellata Jacquin, Stap., t. 6. 1806-19.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 918):

Stems: acutely 4-angled, $1\frac{1}{2}$ to 2 in. long, $\frac{2}{3}$ to $\frac{3}{4}$ in. square, glabrous; angles with acute deltoid teeth 1 to $1\frac{3}{4}$ lin. long;
Leaves: 2 (or more?) together near the base of the young stems;
Petioles: $\frac{1}{2}$ in. long, glabrous;
Stems: 3 lin. long, $\frac{3}{4}$ to 1 lin. broad at the base, lanceolate-subulate, glabrous;
Flowers: about $1\frac{1}{2}$ to $1\frac{3}{4}$ in. in diameter; *tube* campanulate, about $\frac{1}{3}$ in. long and as much or more in diameter at the mouth; *limb* saucer-shaped, lobed to half-way, very abruptly spreading from the tube and raised into a very conspicuous broad convex *annulus* around its mouth, with ascending-spreading *lobes*, about $\frac{1}{3}$ in. long and more than $\frac{1}{2}$ in. broad at the base, broadly deltoid, acute; outside glabrous and smooth; inner face smooth on the raised annulus, densely and minutely papillate on the lobes and rest of the limb, with some stiff clavate outstanding hairs about $\frac{1}{2}$ lin. long on the upper part of the tube, light yellow, marked all over with round crimson spots. those on the annulus slightly raised:

Outer corona: of 5 oblong deeply bifid lobes nearly 1 lin. broad, with parallel obtuse teeth, pale yellowish on the disk with dull red or crimson lobes;

Inner corona: lobes $1\frac{3}{4}$ lin. long, subulate, acute, slightly gibbous at the base, connivent-erect at the lower part, then diverging with erect tips, whitish, spotted with purple-brown.

Type locality: South Africa: without precise locality.

Distribution: Cape Province: between Somerset East and Pearston.

The name of this species comes from "ocellus," the Latin word for a little eye, and it refers to the little crimson dots on the inner face of the light yellow flowers. Its origin was long wholly unknown. It was growing at the Imperial Gardens in

Schönbrunn, Austria, about 1800, and then vanished completely from cultivation. Recently it has been collected again in the eastern extremity of the Great Karroo, between Somerset East and Pearston.

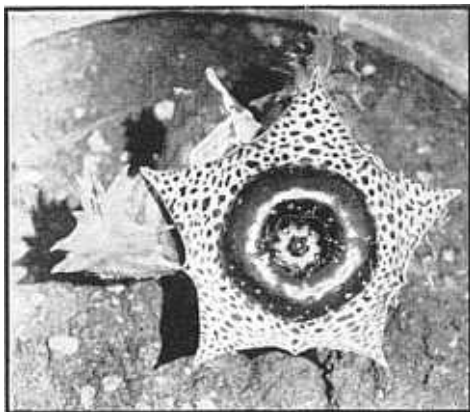


FIG. 967

Huernia ocellata Schultes x 1.

From the collection of David Pringle.

27. ***Huernia venusta*** (Masson) R. Brown, Mem. Wern. Soc., i. 22. 1811.*Stapelia venusta* Masson, Stap. Nov., 10. 1796.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 919):

Stems: erect or divaricate, 2 to 3 (or in cultivated plants up to 5) in. long, $\frac{2}{3}$ to 1 in. thick, acutely 4 to 5-angled, glabrous, green, probably somewhat glaucous; angles compressed, with deltoid spreading teeth 1 to $1\frac{1}{2}$ lin. long;

Flowers: 1 to 2 together near the base of the young stems, successively developed;

Pedicel: about $\frac{3}{4}$ in. long, glabrous;

Sepals: lanceolate, acute, glabrous;

Corolla: in bud somewhat turbinate, with a broad pentagonal flattened top, shortly pointed at the centre, 5-toothed at the angles, glabrous; when expanded about 2 in. in diameter; *tube* very shortly campanulate, glabrous within, blackish-purple or dark blood-red at the bottom; *limb*

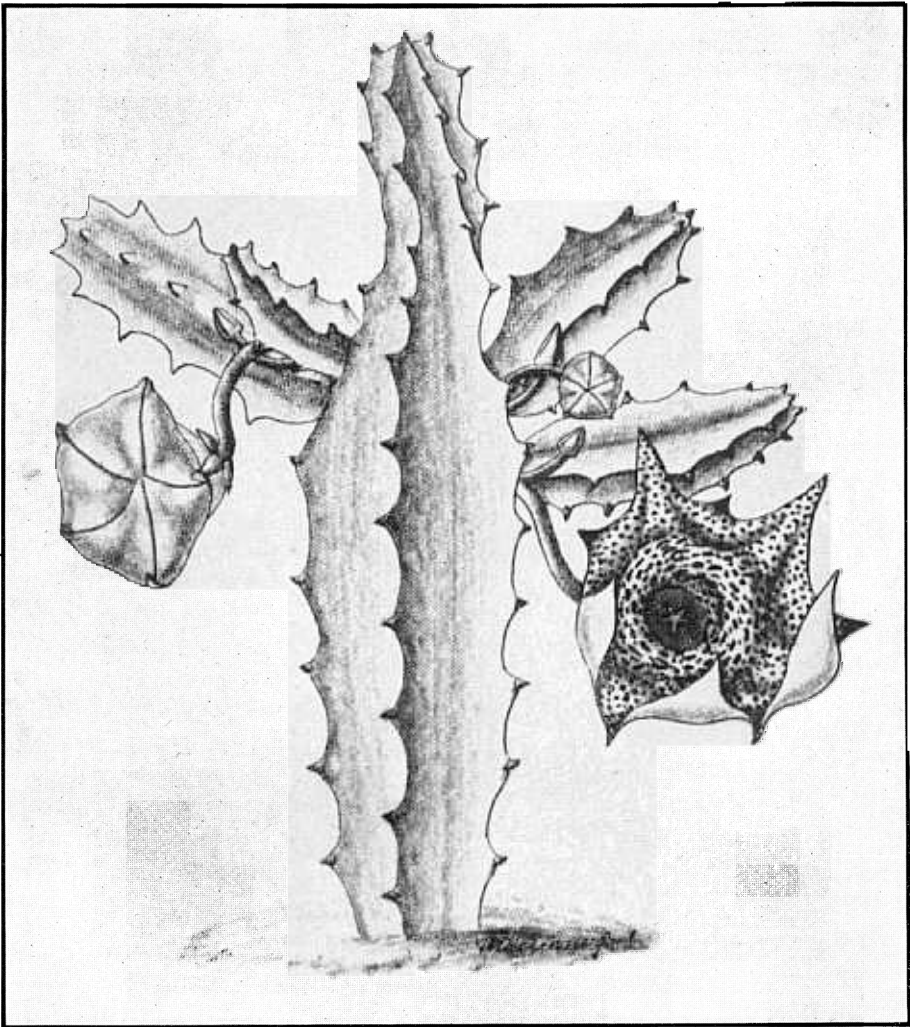


FIG. 968

Huernia venusta R. Brown x 1.From Masson: *Stapeliae Novae*, 1796.

very abruptly spreading from the tube, saucer-shaped, raised into a conspicuous (smooth?) broad *annulus* around the mouth of the tube, with very acute deltoid *lobes* about 6 to 7 lin. long and broad, glabrous, but probably minutely papillate on the inner face, sulphur-yellow, covered to the tips of the lobes with small blood-red spots.

Type locality: Cape Prov.: "dry places in the Karroo" (Masson).

Distribution: Not further known.

The name of this vanished *Huernia*, which is only known from Masson's description, is derived from that of Venus and means "beautiful." The flowers appear to be very large, up to 2 inches diameter, sulphur-yellow with small blood-red flecks, the corolla with a broad annulus and a cen-

tral tube differing from that of any other member of the genus in being wholly glabrous at the base. The corona form is unknown, and Berger's detailed description (Stap. und Klein., 159) appears to have been based on a figure by Jacquin, which Dr. Brown referred to *Huernia guttata*.



FIG. 969

Huernia humilis Haworth x 1.From Hooker's *Icones Plantarum*, 1890.

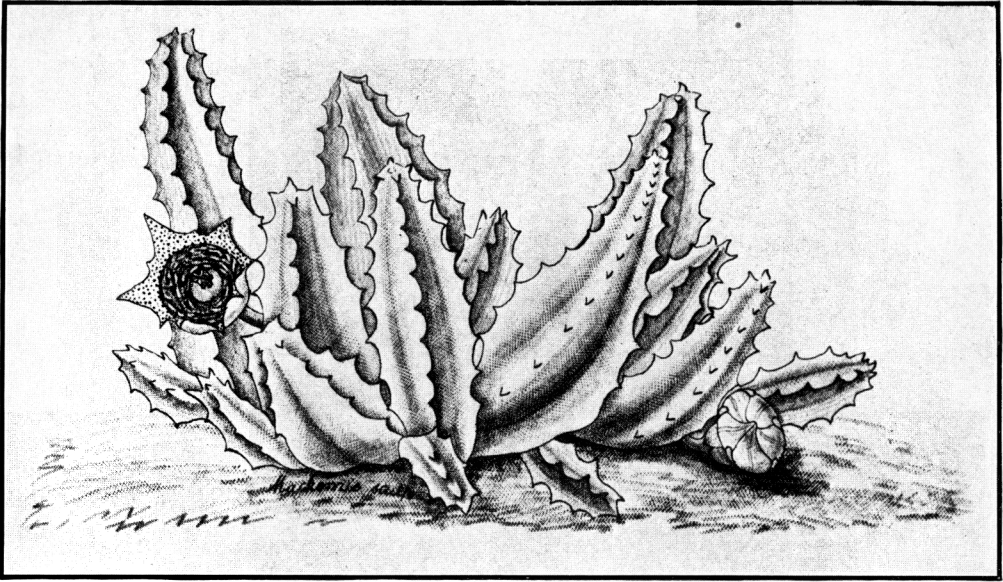


FIG. 970

Huernia humilis Haworth x

from Masson: *Stapeliae Novae*, 1

28. *Huernia humilis* (Masson) Haworth, Syn. Pl. Succ., 30. 1812.

Stapelia humilis Masson, Stap. Nov., 10. 1796.

(Description by Dr. N. E. Brown, *Flora Cap.*, iv. i. 917):

Plant: 2 to 2½ in. high, compact; *stems* erect, 7 to 10 lin. thick, acutely 4 to 5-angled, glabrous, green, glaucous?; angles with acute spreading deltoid teeth 1 to 1½ lin. long;

Flowers: solitary according to Masson, but in Bain's specimen 4 to 5 or more are successively produced on a very short peduncle near the base of the young stems;

Pedicel: ¼ to ⅓ in. long, glabrous;

Sepals: 2½ to 3 lin. long, lanceolate-subulate, glabrous;

Corolla: in bud much flattened, pentagonal, very shortly abruptly and acutely pointed at the centre, with 5 small acute teeth at the angles and 5 very prominent ribs radiating from the point, glabrous; when expanded 1 to 1¼ in. in diameter, with a very shallow saucer-shaped tube and a very abruptly spreading limb, lobed to more than half-way and raised into a broad convex ring around the mouth of the tube, glabrous; *lobes* deltoid in Masson's figure, deltoid-ovate and minutely papillate in Bain's specimen, very acute, pale yellow, dotted with blood-red; *annulus* smooth, blackish-purple, marked with undulated whitish spots;

Outer corona: small, with very short transverse bifid lobes or subequally 10-toothed;

Inner corona: lobes about ½ lin. long, ovate, acuminate, incumbent on the backs of the anthers and not produced beyond them.

Type locality: South Africa: without locality.

Distribution: Cape Prov.: Beaufort West Distr.: Nieuwveld Mountains; De Aar Distr.

The "lowly *Huernia*" was discovered by Francis Masson, who says it grew "in dry places in South Africa." Again collected about 1875 by Thomas Bain in the Great Karroo, but no longer in cultivation. The

flowers are characterized by the very fleshy annulus, blackish-purple, with wavy whitish spots. The corolla-lobes are pale yellow, dotted with blood-red.



FIG. 971

Huernia confusa Phillips x 1.5

Photo by Herbert Lang.

29. *Huernia confusa* Phillips, Flow. Pl. So. Afr., t. 456. 1932.

Huernia humilis Schlechter, Engler: Jahrb., xx. Beibl. 51. 1895. *Nec* Haworth, 1812.

(Description by Dr. Phillips, l.c.):

Plant: up to 6 cm. high; *stems* erect, 4 to 5-angled (mostly 4-angled), bluish-green, glabrous; angles with acute spreading deltoid teeth which end in a sharp spine-like rudimentary leaf about 3 mm. long;

Flowers: in groups of 4 to 5, successively blooming near the base of the young stems;

Pedicel: up to 1 cm. long, glabrous;

Sepals: 8 mm. long, ovate, long-acuminate, glabrous;

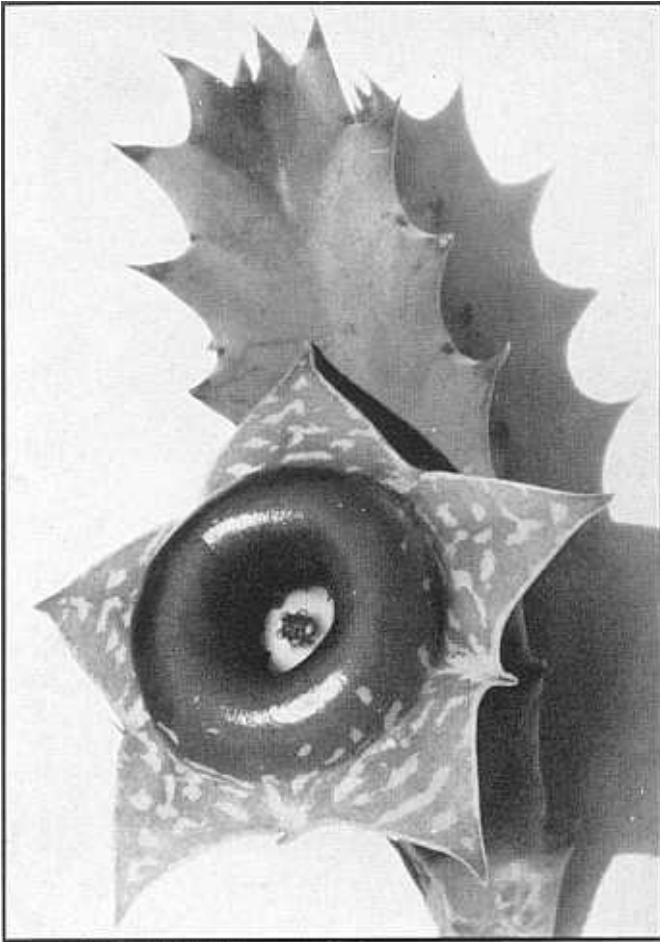
Corolla: when in bud greenish-white tinged with red, cup-shaped, horizontally flattened, pentagonal, very shortly and abruptly pointed at the centre, with 5 acute teeth at the angles and 5 prominent ribs radiating from the point, glabrous; when expanded 3 cm. in diameter; *tube* bright yellowish-crimson, cup-shaped, 6 mm. wide, 7 mm. deep, smooth; *annulus* slightly overhanging the mouth of the tube, yellowish-crimson, with flecks of greenish-white, 6 mm. wide; *lobes* triangular, shortly acuminate, with irregular light red markings on a pale greenish-white ground, minutely papillate; intermediate teeth acute;

uter corona: appressed to the base of the corolla-tube; lobes 1 mm. long, 2 mm. broad, obtusely 2-lobed;

ner corona: lobes 1 mm. long, claw-like, bent over the anthers and not produced beyond them, with a dorsal crest at the elbow, bright yellow.

ype locality: Transvaal: Pietersburg Distr.: foot of the Woodbush Range, 5500 feet elevation.

istribution: Also recorded from Haenertsburg in the same district, along edge of flat rocky outcrops on northern slopes of hills; Lydenburg Distr.: on a farm just outside of Lydenburg.



972

A *Huernia*, closely allied to *H. confusa*, collected by Miss A. A. Obermeijer near Zwakershoek, Lydenburg district.

Photo by Herbert Lang.

A species closely related to *Huernia humilis*, but whose habitat is 600 miles further to the north, in the northern Transvaal, 40 miles from Pietersburg. It was first collected April 1, 1894, by Dr. R. Schlechter, who incorrectly referred it to *H. humilis*. Dr. Brown in the *Flora Capensis* queried the correctness of this identifica-

tion, alike because of the separate habitats and because of the totally different colors attributed to the flowers. In 1931 Dr. H. G. Schweickerdt again collected the plant not far from where Dr. Schlechter had found it. The description by Dr. Phillips quoted above was based on this fresh material, and the name refers to the "confusion" which had ensued from the existence of two "Lowly Huernias." According to Dr. Phillips, "the plant differs from *H.*

humilis Haw. in having larger stem teeth, longer pedicels, longer sepals, in the depth and shape of the corolla-tube, the lesser width of the annulus and the differently shaped corona-lobes." The color of the flowers also varies, and does not fully agree with the specifications given of his plant by Dr. Schlechter, who said it ranged from flesh-red to brownish, with large purple spots on the lobes and limb, the annulus varying from rose-red to dark purple-red.

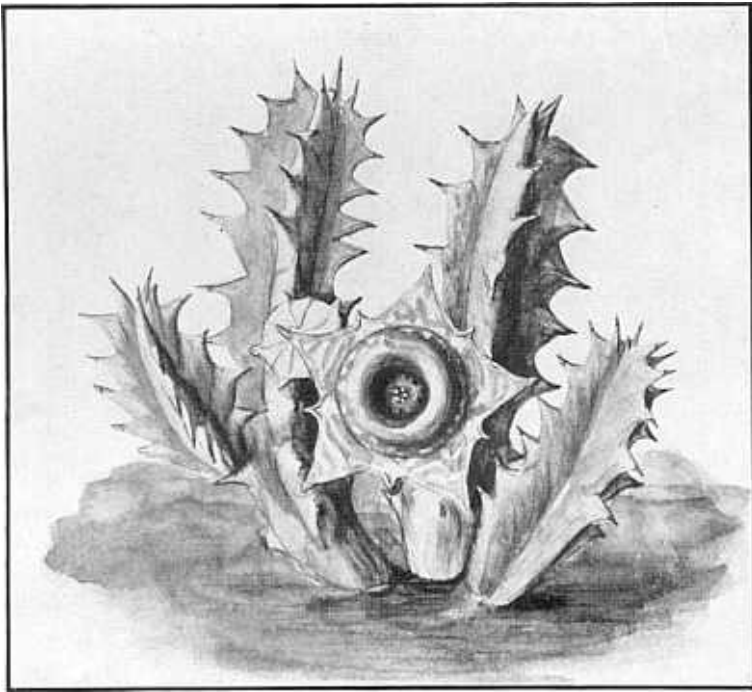


FIG. 973

Huernia confusa Phillips x 1.

From the original water color drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1932.

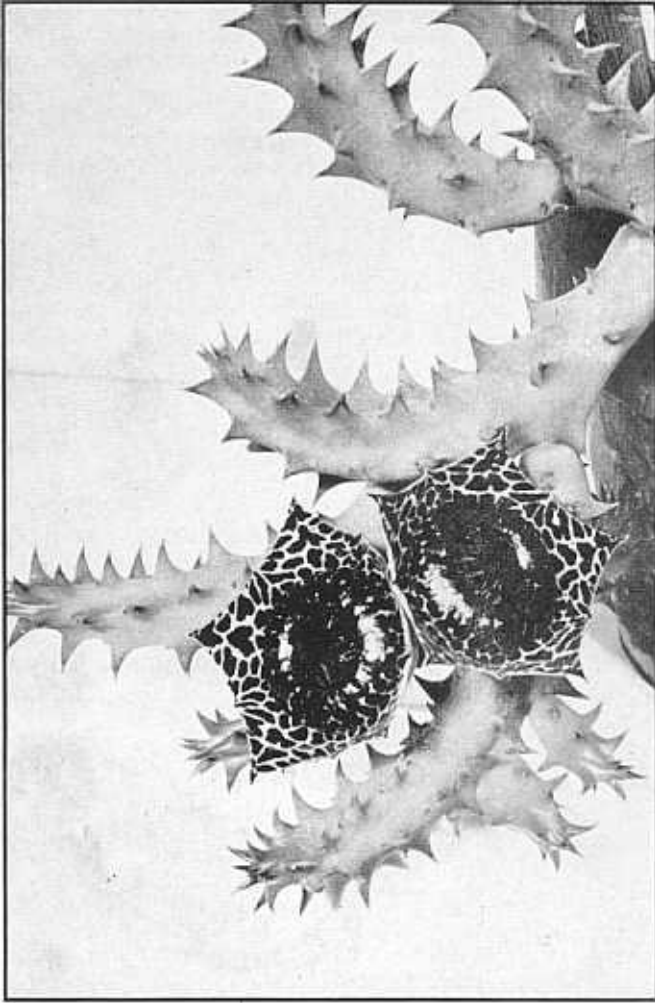


FIG. 974

Huernia reticulata Haworth x 1

30. ***Huernia reticulata*** (Masson) Haworth, Syn. Pl. Succ., 28. 1812.

Stapelia reticulata Masson, Stap. Nov., 9. 1796.

Stapelia crassa J. Donn, Hort. Cantab., 3 Ed., 43. 1804.

Huernia barbata Schlechter, Journ. Bot., 485. 1898. *Nec* Haworth, 1812.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 920) :

Plant: 3 to 4 in. high; *stems* erect or ascending, $\frac{3}{4}$ to 1 in. thick, including the teeth, acutely 5-angled, glabrous, green, mottled with purple; angles often spiral, with large deltoid acute spreading teeth;

Flowers: 1 to 4 together, successively developed near the base of the young stems;

Pedicel: 3 to 9 lin. long, $\frac{3}{4}$ lin. thick, glabrous;

Sepals: 3 to $3\frac{1}{2}$ lin. long, lanceolate, acuminate, glabrous;

Corolla: in bud somewhat turbinate, with a very broad flat top, subpentagonal, shortly 5-toothed at

the angles, prominently nerved, whitish, speckled or tinged with purplish on the glabrous outside; when expanded $1\frac{1}{4}$ to $1\frac{3}{4}$ in. in diameter; *tube* campanulate, 4 lin. long, 5 lin. in diameter; *limb* saucer-shaped, lobed to half-way down, very abruptly spreading from the tube and raised around its mouth into a very conspicuous broad smooth and shining annulus; *lobes* 3 to 6 lin. long, broader than long at the base, broadly deltoid, very acute; inside, the upper part of the dark blood-red tube is thickly covered with stiff glassy clavate purple hairs, those at the mouth converging and much larger than those below, and the lobes are sometimes sprinkled with minute setules, elsewhere glabrous, pale yellow, thickly covered with rather large blood-red or deep crimson-brown spots, which are more or less confluent, producing a reticulated appearance, or sometimes the annulus is entirely crimson;

Outer corona: 10-toothed, purple-black, velvety; teeth deltoid, acute, upturned;

Inner corona: lobes reaching to about $\frac{2}{3}$ of the length of the corolla-tube, subulate, acute, connivent over the style-apex at the lower part then widely diverging, with erect tips, red at the base, whitish mottled with deep red above.

Type locality: Cape Prov.: Clanwilliam Distr.: among rocks near Olifants River.

Distribution: Also from "northern slopes of ridges near Clanwilliam; Van Rhynsdorp Distr.: sandy plains near Klaver.

Discovered by Francis Masson, and again collected in Sir Henry Barkly's day and in recent years. While not general in collections, the species has very interesting flowers and deserves to become better known. The color of the flowers is pale yellow, the ground color showing like con-

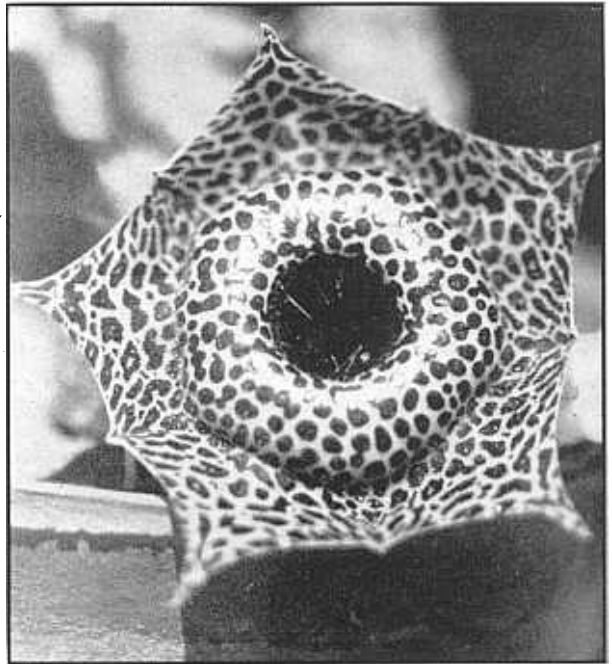
nected lines between the large blood-red spots and so producing the "reticulated," or network-like, appearance from which the plant won its name. The odor of the flowers has been called "strong, putrid," and while the adjectives are themselves strong, they are certainly not exaggerated.

FIG. 974-A

A remarkable *Huernia*, discovered in a single plant at Doornrivier, Richtersveld, Little Namaqualand, by Ray H. N. Smithers.

The stems (see Fig. 1186) are unusually tall, up to 8 inches, and toothed somewhat like those of *H. oculata*. They have a habit of underground growth, more generally associated with *Carallumas*, developing underground stems up to 10 inches long.

The flowers suggest a resemblance to those of *H. reticulata*, especially in the long stiff hairs, 2 to 4 lines long, at the mouth of the corolla-tube; but the corolla is larger, 2 inches in diameter, and the spots more nearly circular, especially on the annulus. The color is light yellow with the markings dark reddish-purple, the base of the tube brownish-black. The corona is not known. Pending the opportunity for a more complete description, we propose the provisional name, *Huernia smithersii*, nom. prov. (Species nova primo intuitu *Huerniam reticulatam* arcte



tangit, sed corolla majore, maculis ad normam exactioribus et super annulum rotundioribus dignoscitur). Photo by W. Triebner.

31. *Huernia transvaalensis* Stent, Kew Bull., 249. 1914.

(Description by Miss S. M. Stent, l.c., translated from the Latin):

Stems: 4 to 6 cm. long, 15 to 18 mm. thick (excluding the teeth), 4 to 5-angled, glabrous, with deltoid acute teeth 4 to 7 mm. long;

Flowers: 1 to 3, from the base of the stems;

*Pedice*l: 12 to 18 mm. long, glabrous;

Sepals: 10 to 14 mm. long, subulate-attenuate, glabrous;

Corolla: 4 to 5 cm. in diameter; outside glabrous, washed with purple; inside papillate at the mouth of the tube, the papillae tipped with long purple hairs, otherwise glabrous; *tube* 7 to 8 mm. long, 6 to 7 mm. in diameter at the mouth, campanulate, pale; *limb* spreading horizontally from the tube; *annulus* cushion-like, dark purple, very shiny; *lobes* spreading, 1½ cm. long and broad, deltoid, acuminate, reddish-purple, at the base irregularly flecked with pale yellow;

Outer corona: lobes 2 mm. long, 3 mm. broad, rectangular, shortly and obtusely bifid, yellowish with purple margins;

Inner corona: lobes 3 mm. long, subulate, acute, erect at the base, recurved above, purple.

Type locality: Transvaal: Pretoria Distr.: Magaliesberg Range: near Crocodile Poort, frequent for many miles.

Distribution: Also from Rustenburg District: near Rooikopjes, near Brits; Northam; and near Magut, on the border between Swaziland and Natal.

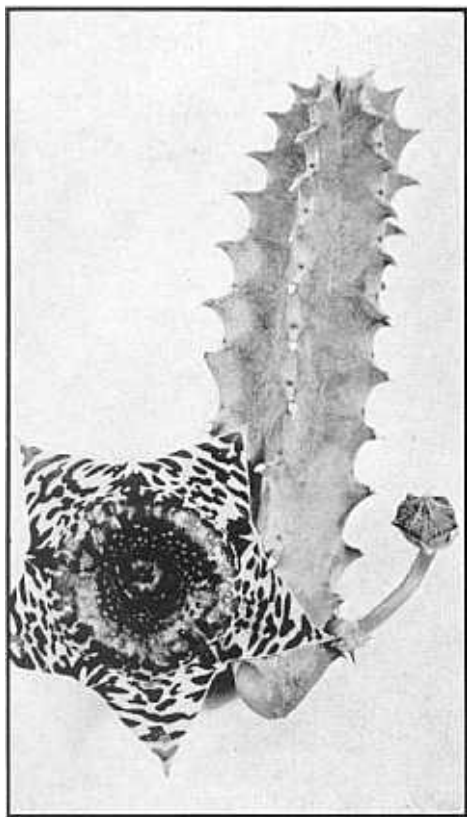


FIG. 975

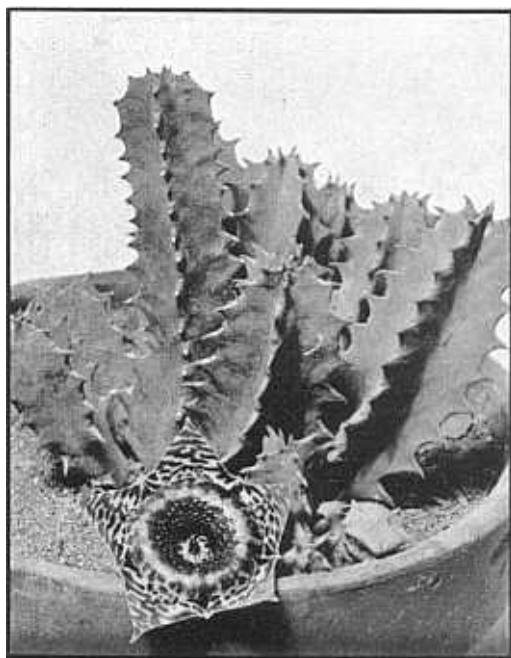
Huernia transvaalensis Stent x 1

FIG. 976

Huernia transvaalensis Stent x 0.75

The "Transvaal *Huernia*" has been called a "life-buoy plant" from the dominant appearance of the annulus on the corolla. It differs from *Huernia guttata* and

H. zebrina in having the inner corona-lobes of the *Orthostelma* type, erect with recurved tips prolonged above the anthers. It is also distinguished by the long purple hairs on the papillae at the mouth of the corolla-tube. The annulus is not spotted, but of a uniform shade suggestive of raw beef liver, so shiny as to reflect light and hinder most attempts at photography. The species was discovered by Dr. I. B. Pole Evans on August 24, 1913, growing in sandy places among rocks on the Magaliesberg range in the Transvaal.

Huern

FIG. 9
Stent

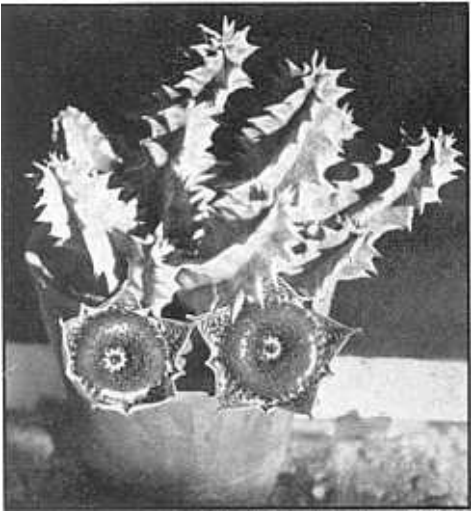
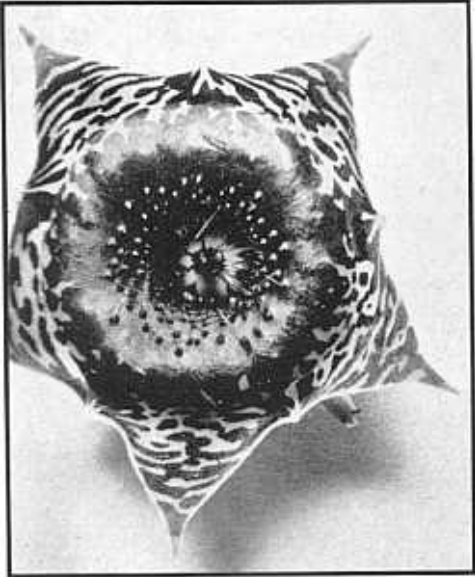


FIG. 977-A
Huernia transvaalensis Stent
Photo by W. Triebner.

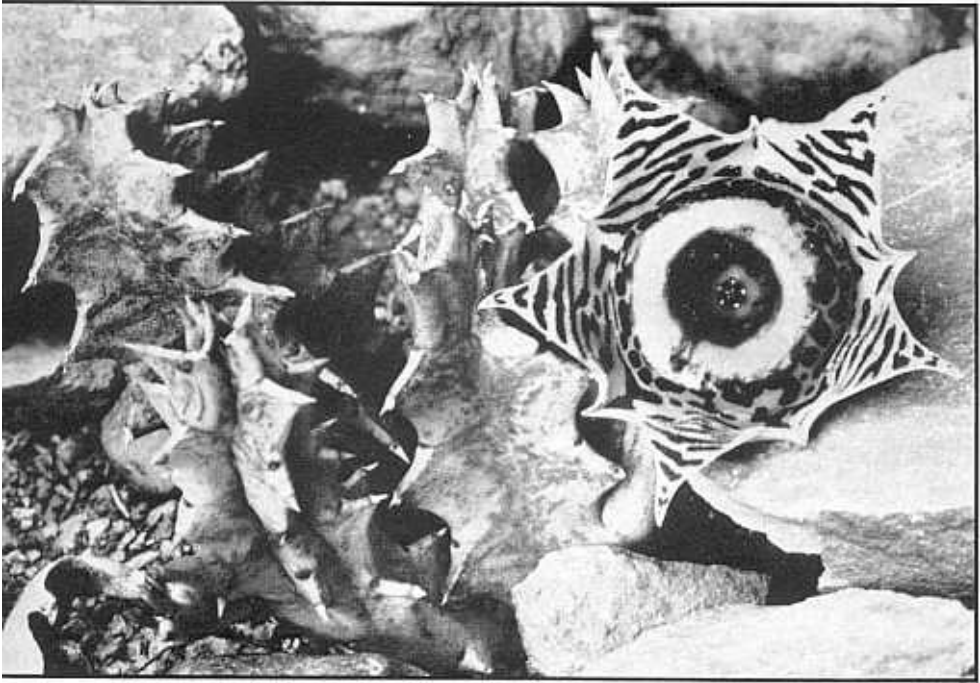


FIG. 978

Huernia zebrina N. E. Brown x 1.5

Photo by Herbert Lang of a typical flower from Mkusi, Zululand. The ground color of the corolla-lobes is pale yellowish and the stripes are dark purple.

32. *Huernia zebrina* N. E. Brown, *Flora Cap.*, iv. i. 921. 1909.

(Description by Dr. Brown, l.c.):

Stems: 2 to 3 in. high, 4 to 5 lin. in diameter without the teeth, 5-angled, green; angles compressed, with stout conical acute spreading teeth 2 to $2\frac{1}{2}$ lin. long;

Flowers: 2 (or more?) together near the base of the young stems, successively developed;

Pedicel: 6 to 7 lin. long, glabrous;

Sepals: 3 to 4 lin. long, spreading, subulate-acuminate from an ovate-lanceolate base, glabrous;

Corolla: $1\frac{1}{2}$ to $1\frac{3}{4}$ in. in diameter, puberulous on the lobes within, elsewhere glabrous; *tube* very shortly campanulate, constricted and about $\frac{1}{4}$ in. in diameter at the mouth; *limb* slightly saucer-shaped very abruptly spreading from the tube, raised around its mouth into a broad thick convex ring; *lobes* about 5 lin. long and $\frac{1}{2}$ in. broad at the base, deltoid, very acute; inner surface sulphur-yellow or pale greenish-yellow, marked with transverse purple-brown broken bands which pass into spots upon the smooth shining annulus, and in the only dried flower seen are very evident on the back of the lobes;

Outer corona: lobes contiguous, $\frac{1}{2}$ to $\frac{2}{3}$ lin. long, $1\frac{1}{3}$ lin. broad, transversely oblong, subtruncate with a notch at the middle;

Inner corona: lobes scarcely $\frac{1}{2}$ lin. long, deltoid-lanceolate, acute, with a dorsal transverse ridge at the base, closely incumbent upon the backs of the anthers and not produced beyond them.

Type locality: Zululand: without precise locality.

Distribution: The habitat at Mkusi refers to the type; that in the Potgietersrust district, Transvaal, to the var. *magniflora*; but the remainder cannot yet be assigned with cer-

tainty: Zululand: Mkusi; Transvaal: Zoutpansberg Distr.: between Zoutpan and Waterpoort; Potgietersrust Distr.: Kwarrie Hoek; Pietersburg Distr.: Brodie Hill Farm; Barberton Distr.: near Komatipoort; Bechuanaland Protectorate: Serowe; South West Africa: Great Namaqualand: Ussis-Schlucht.

The "zebra-like *Huernia*" is happily named to call to mind the distinctive purple-brown stripes on the pale greenish-yellow background of the corolla-lobes. As in the other "life-buoy *Huernias*" the annulus is very prominent and so shiny as to reflect light and make photography difficult. The annulus closely surrounds the small campanulate tube at whose base the typical corona, with incumbent inner corona-lobes, is clearly seen. In plants found under thorn bushes in sandy flats of the Pietersburg district, northern Transvaal, of the var. *magniflora* (?), well within the tropic, the annulus was unmarked, uniformly colored in the same shade as the dark zebra bands of the lobes, and this peculiarity of an unmarked annulus is occasionally found in flowers from other sections. In general, especially in flowers distinctly of the type form, the zebra bands continue from the corolla-lobes at least half-way up the side of the annulus in the shape of large spots.

H. zebrina was first reported from Eshowe, Zululand, by a relative of Mrs. K. Saunders, about 1900 (?), but it is uncertain just where this specimen was collected. The first definite record for any form of the species dates from April, 1913, when Prof. Dinter discovered a plant of the *zebrina* clan in the southerly Karas

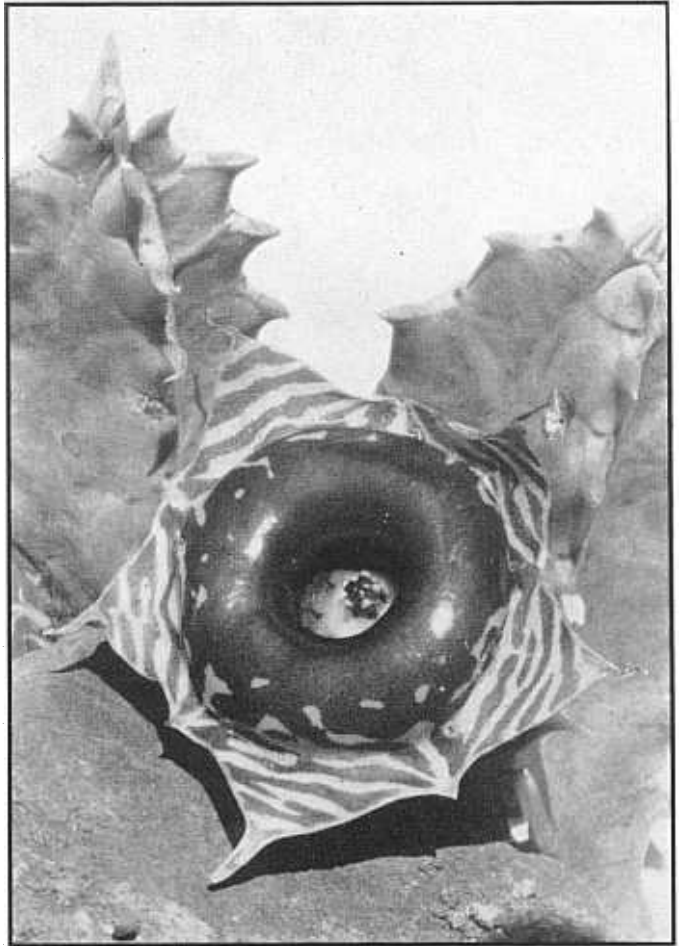


FIG. 979

A *Huernia* collected by Miss Obermeijer, Miss Verdoorn and Dr. Schweickerdt near Waterpoort, Zoutpansberg district, Transvaal. It appears to be a form of *H. zebrina*, but the corona differs from that of *H. zebrina*, as well as from that of the var. *magniflora*. Photo by Herbert Lang.

mountain area of Great Namaqualand, on the east slope of the Us River, 25 miles north of Kanus (Fig. 982). This plant seemed to Prof. Dinter to differ from the type of *H. zebrina*, as described by Dr. N. E. Brown, because the inner face of the corolla-lobes was thickly papillate rather

than puberulous, and the inner corona-lobes were not acute. But when Prof. Dinter consulted Dr. Brown, the latter said he thought that the South West African plant probably did represent the type and that the record of the type from Zululand might well prove to have been an error. The two

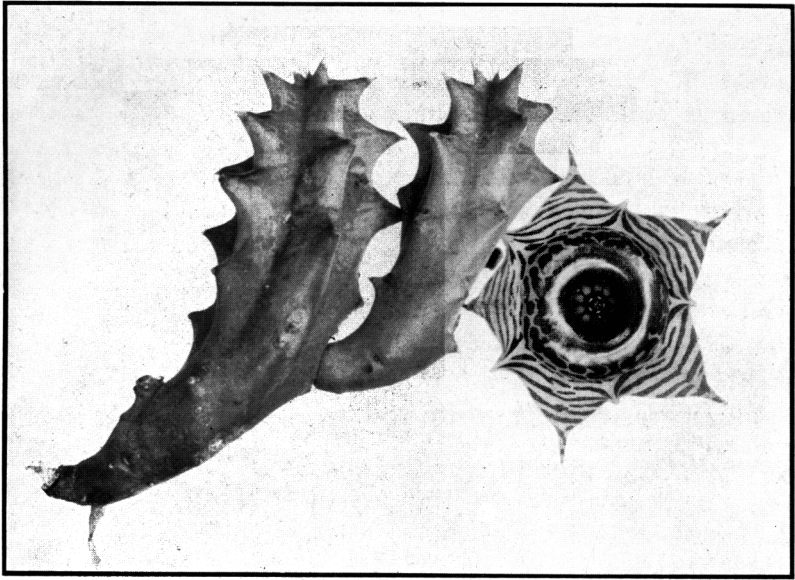


FIG. 980

Huernia zebrina N. E. Brown x 1.

Photo: G. W. Reynolds, Johannesburg.

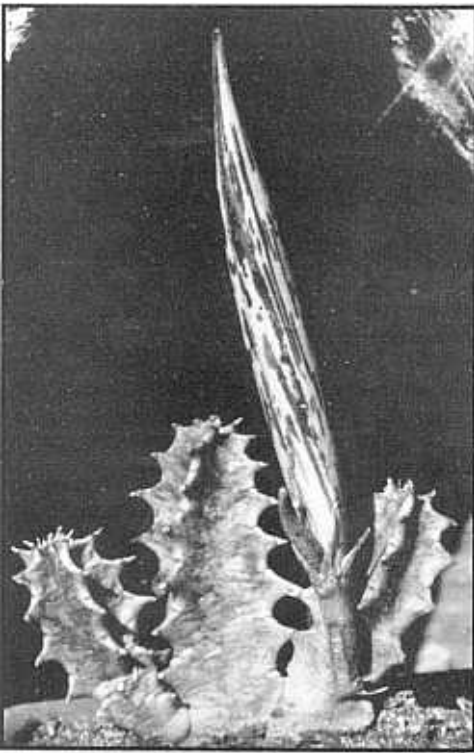


FIG. 981

Huernia zebrina N. E. Brown

Photo of a solitary seed-pod by A. Probst and E. R. Svensson.

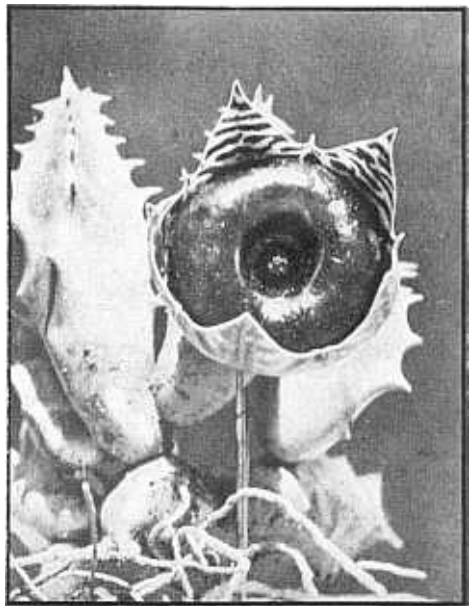


FIG. 982

Huernia zebrina N. E. Brown x 1.

Photo by Prof. Dinter in Neue Pfl. D. S.-W. Afr., 1914, of a plant from Ussis-Schlucht, South West Africa.

localities seemed, indeed, too remote from one another to harbor the same species. However, R. E. Symons has since localized *H. zebrina* at Mkusi, Zululand, and we now know that forms of the plant span the entire South African subcontinent in a long arc, whose ends rest at Mkusi on the east and Kanus on the west, and whose slow curve passes all across the northern Transvaal and probably all the way across the Bechuanaland Protectorate.

We cannot yet subdivide *H. zebrina* into all its varieties; but Mr. Lang, who has made a special study of the species, reports at least six distinct local forms, and these may later all become established as individual varieties or some of them even as separate species. Dr. E. P. Phillips has very recently set one of these forms apart

as the var. *magniflora*

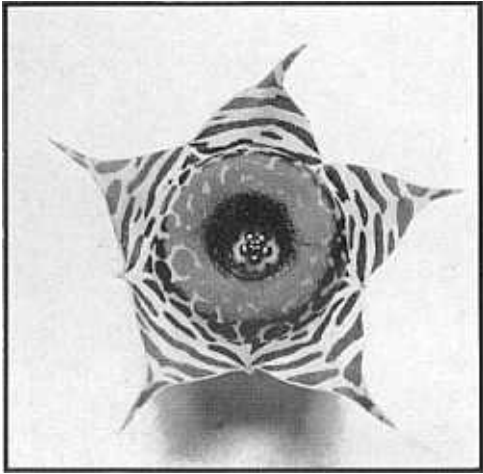


FIG. 98:
Brown

Huer

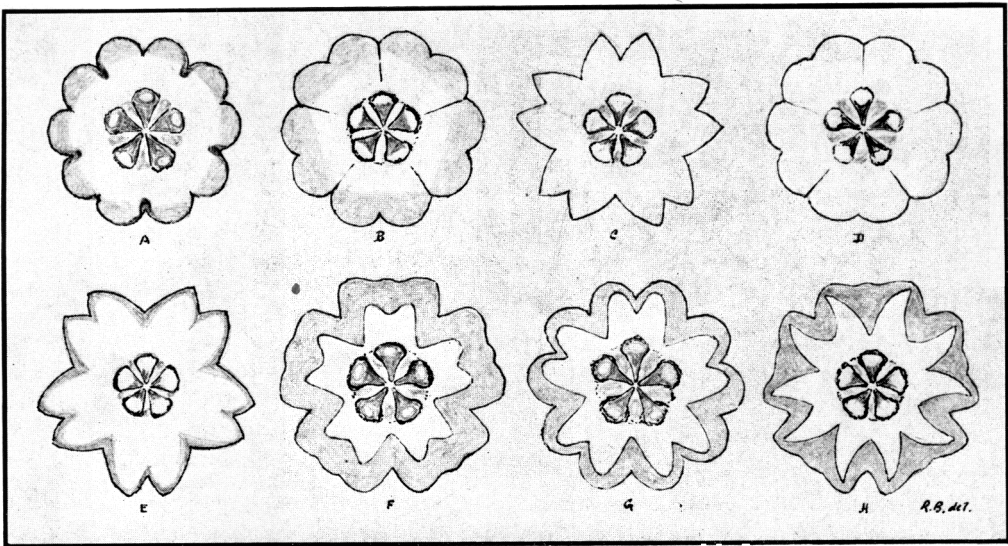


FIG. 984
Coronas of *Huernia zebrina* and related species and varieties
From a drawing by Dr. R. Broom.

- A. *Huernia zebrina*, Zululand, see Fig. 978;
- B. *Huernia*, related to *H. confusa*, Lydenburg, see Fig. 972;
- C. *Huernia confusa*, Woodbush, see Fig. 971;
- D. *Huernia insigniflora*, see Fig. 989;
- E. *Huernia zebrina* var. (?), Waterpoort, see Fig. 979;
- F. *Huernia zebrina* var. (?), Kloppersfontein, see Fig. 985;
- G. *Huernia zebrina* var. *magniflora*, Waterpoort, see Plate XXVII;
- H. *Huernia zebrina* var. (?), Waterpoort, not figured.

Note that in all the north Transvaal forms of *H. zebrina* there is a tendency for the outer corona to have a distinct white area surrounded by a dark purple border, so that at first sight the outer corona appears to consist of five more or less bifid lobes, which are quite different in shape to the actual contours. This is especially marked



FIG. 985

Huernia zebrina var. (?)

Photo by Herbert Lang of a plant collected by Miss A. A. Obermeijer at Kloppersfontein, Kruger National Park. The flowers have a large corolla, 6 cm. in diameter, the lobes dark wine color with some yellow lines. The corona form is shown in Fig. 984: F. See also Fig. 986.

Var. a. *Huernia zebrina* var. *magniflora* Phillips, Flow. Pl. So. Afr., t. 613. 1936.

?*Huernia blackberdae* R. A. Dyer, ex Jacobsen, Sukkulenten, 75. 1933. (See Figs. 987-8).

?*Huernia blackbeardae* R. A. Dyer, ex Jacobsen, Succulent Plants, 106. 1935.

(Description by Dr. E. P. Phillips, l.c.):

Stems: bluish-green, up to 12 cm. high, 1.5 to 2 cm. in diameter including the teeth, 4 to 5-angled; angles compressed, with small spine-tipped teeth on some stems, with teeth up to 5 mm. long usually on the younger growths;

Flowers: arising at the base of the young stems, numerous, successively developed;

*Pedice*l: 1 cm. long, glabrous;

Sepals: 1.3 cm. long, 0.3 cm. broad at the base, subulate-acuminate from an ovate-lanceolate base, glabrous;

Corolla: yellowish-white, marked with transverse light purple-carmine (R. C. S.) broken bands which pass into spots and blotches and finally merge on the smooth shining annulus, 6.5 to 7.5

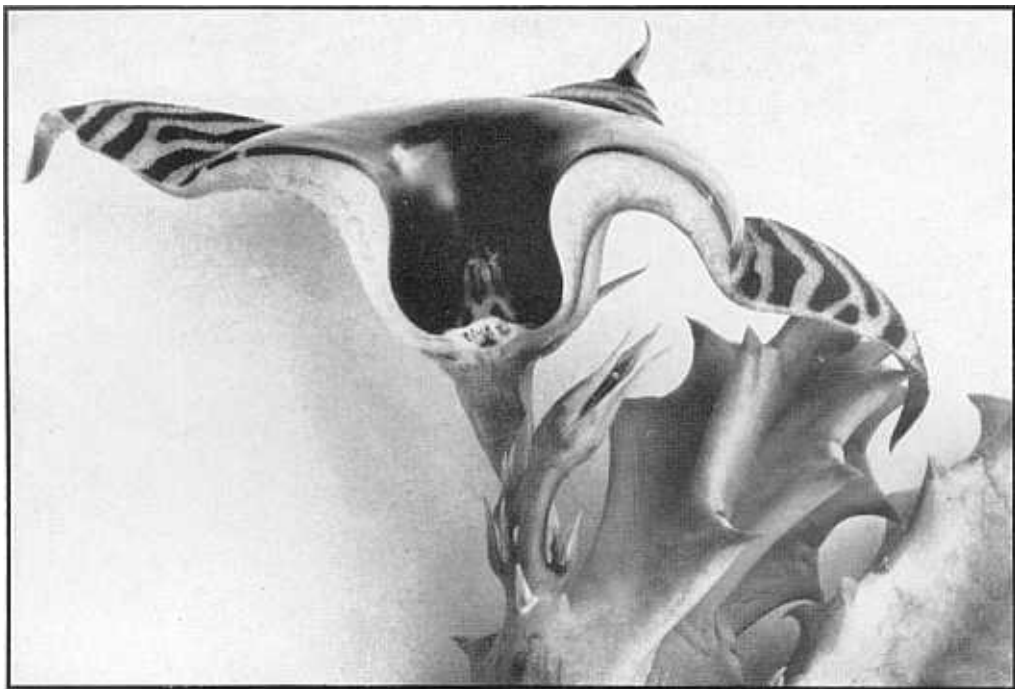


FIG. 986

Huernia zebrina var. (?)

Photo by Herbert Lang of a cross-section of the corolla.

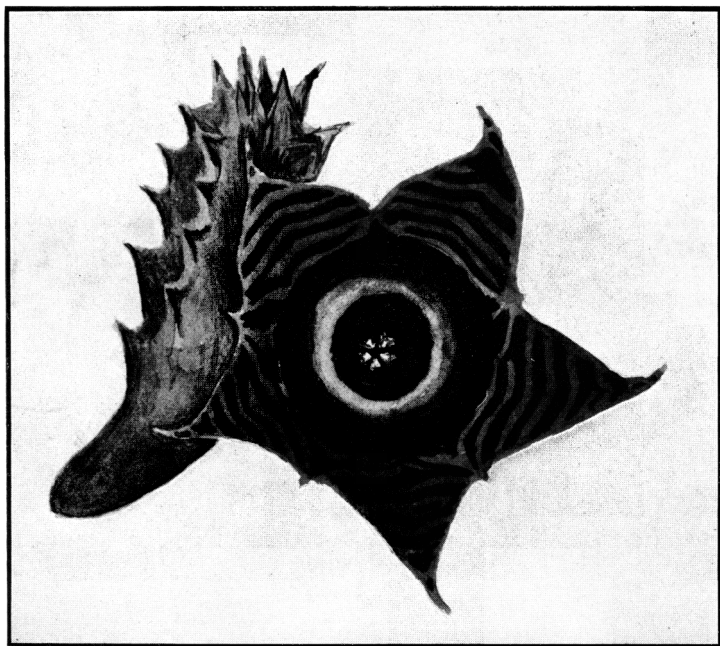


FIG. 987

Huernia zebrina var.
magniflora Phillips

From a reproduction by Dr. R. Broom of a sketch by Miss G. Blackbeard of a flowering stem collected by her at Serowe. The identification is not certain.



Cythna
Letty.

PLATE XXVII.

Huernia zebrina var. *magniflora* Phillips

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1936.

cm. in diameter (as the flower matures the annulus contracts slightly decreasing the measurement of the diameter), puberulous on the lobes within, elsewhere glabrous; *tube* 7 mm. deep, 9 mm. in diameter at the mouth, very slightly constricted; *limb* spreading abruptly from the tube, raised around its mouth into a broad thick convex annulus 1 cm. wide and 4 mm. thick; *lobes* 2.2 to 2.4 cm. long, 2.2 cm. broad at the base, triangular, acuminate;

Corona: 6 mm. in diameter, 5 mm. high;

Outer corona: 5-lobed; lobes white, evenly edged with velvety purple-black, deeply bifid, 3 mm. long, almost 2 mm. broad;

Inner corona: lobes dark purple-red, with a bright yellow dorsal crest at the elbow, 1.5 mm. long, deltoid-lanceolate, acute, incumbent on the anthers, with the tips meeting.

Type locality: Transvaal: Potgietersrust Distr.

According to Dr. Phillips, this variety differs from the type in its larger flowers, the shorter corolla-tube and the different markings on the corolla. Miss Obermeijer writes us that she has found most of the north Transvaal records of *H. zebrina* to conform to this "large-flowered variety," but the coronas of flowers from different plants vary so much, as shown in Fig. 984, that further subdivision may yet be necessary. Probably the plant shown in Figs. 987-988, from Serowe, Bechuanaland Protectorate, also conforms to this variety. Whether the South West African plant (Fig. 982) likewise resembles this variety is more doubtful. The smaller size of the corolla, 4.3 cm. in diameter, seems to point back towards the type, or perhaps towards another, more noticeably papillate, variety.

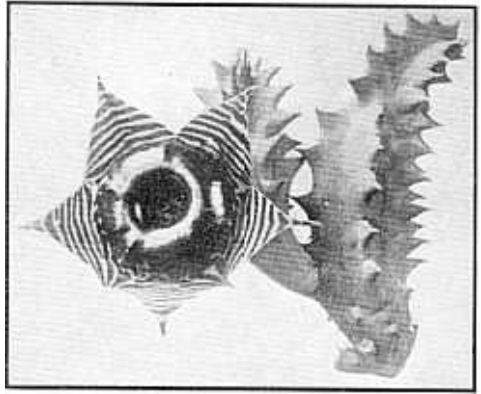


FIG. 988

Huernia zebrina var. *magniflora* Phillips x 0.6

Photo by R. A. Dyer in Rec. Albany Museum, 1931, of a flowering stem collected by Miss G. Blackbeard near Serowe, Bechuanaland Protectorate. The identification is not certain.

33. *Huernia insigniflora* C. A. Maass, Deutsch. Gärtn.-Zeitung, 79. 1928.

(Description summarized from that by Herr Maass, l.c., translated from the German):

Stems: 5 to 10 cm. high, 15 to 20 mm. thick excluding the teeth, 4-angled, dull greyish-green, the angles not much compressed, with acute spreading teeth 5 to 6 mm. long;

Flowers: generally solitary from the base of the young stems;

*Pedice*l: about 12 mm. long;

Sepals: acute, glabrous;

Corolla: 4 to 4½ cm. in diameter, rotate; *tube* 4 mm. wide, narrower at the base; *limb* abruptly spreading; *annulus* dark purple-brown, 6 to 8 mm. wide, 20 to 22 mm. in outside diameter; *lobes* 10 to 12 mm. long, 12 mm. broad at the base, with a faint convex rib down the middle, the tips bent backwards; outside minutely papillate; inside glabrous, pale rose without markings; the intermediate lobes reduced to small teeth;

Outer corona: dark blackish-purple;

Inner corona: lobes yellow, flecked with dark purple.

Type locality: (?) Cape Prov.: Graaff Reinet Distr.: Kendrew; or Transvaal.

Distribution: Not further known.

The flowers make this species rank among the most striking of the *Huernias*. The combination of a deep purple annulus with surrounding corolla-lobes of pale rose, without markings, fully justifies the name, the "*Huernia* with remarkable flowers." The origin of the plant is uncertain, but Miss I. C. Verdoorn writes us that it may have been first collected by Mr. Levisseur at Kendrew, Graaff Reinet, prior to 1927. In that year a plant was sent by Mr. van Son in Pretoria to the firm of Friedr. Ad. Haage Jr., in Erfurt, Germany, and through this firm it was distributed to collectors in Europe.

Mr. van Son believes that *H. insigniflora* is native to the eastern Transvaal, perhaps to Barberton or Lydenburg districts, while Mr. Vogts attributes it to Crocodile Poort in the Magaliesberg range, Pretoria district. The relation of the flowers to other *Huernias* with a shiny purple annulus, such as *H. confusa*, makes the Transvaal habitat appear probable.

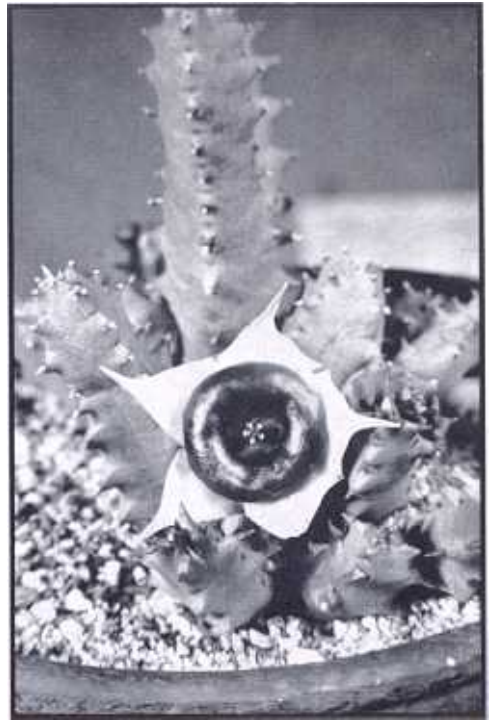


FIG. 989

Huernia insigniflora Maass x 1

34. *Huernia decemdentata* N. E. Brown, *Flora Cap.*, iv. i. 908. 1909.

(Description by Dr. Brown, l.c.):

Stems: not seen, "short, stout, in dense clusters" (*Rabjohn*);*Pedice*l: 1 lin. long in the only flower seen (? perfect), stout, glabrous;*Sepals*: 2 lin. long, 1 to $1\frac{1}{4}$ lin. broad, broadly ovate, shortly subulate-acuminate, glabrous;*Corolla*: campanulate, about $\frac{3}{4}$ in. in diameter, without any constriction to the tube, subequally 10-toothed at the top, apparently very minutely papillate-asperate outside, inside with the basal part smooth and glabrous, above a belt about $\frac{1}{3}$ in. broad densely covered with stout flattened clavate hairs $\frac{1}{2}$ to 1 lin. long, and the apical fourth of the tube and the teeth densely and minutely papillate; *tube* of the dried flower 10 lin. long, apparently purple-brown within, bordered with a paler color (greenish-yellow?) at the mouth; larger *teeth* $1\frac{1}{2}$ lin. long and rather broader at the base, smaller teeth 1 lin. long and about $1\frac{1}{2}$ lin. broad at the base, all deltoid acute;*Outer corona*: 5-lobed, blackish; lobes $\frac{2}{3}$ lin. long, 1 to $1\frac{1}{4}$ lin. broad, transversely oblong, emarginate, crenately 3 to 4-toothed or acutely bifid at the apex, varying in the same flower;*Inner corona*: lobes $1\frac{3}{4}$ lin. long, subulate, connivent-erect at the basal part, then diverging, with erect tips, dark purple-brown.

Type locality: South Africa.

Distribution: Unknown.

The "ten-toothed *Huernia*" is an imperfectly known species of unknown South African origin, of which a single flower was sent to the Royal Botanic Gardens, Kew, about 1900, by Mr. Rabjohn. The color of the flowers is described by him as dark brown, almost black. They are remarkable

because the intermediate "*Huernia* teeth" of the corolla are almost as large as the regular corolla-lobes with which they alternate, giving the bell-shaped corolla the appearance of having ten almost uniform lobes, or "teeth" as Dr. Brown called them owing to their very small size.

35. *Huernia levyi* Obermeijer, Flow. Pl. So. Afr., t. 616. 1936.

(Description by Miss A. A. Obermeijer):

Stems: erect, 7 cm. high and 3.5 cm. thick including the teeth, 4 to 5-angled and deeply grooved between the angles; teeth 1 cm. long, triangular, acute; leaf rudiments narrow-ovate, 2 mm. long, deciduous;

Flowers: 1 to 3 together at the base of the stems, developing successively;

*Pedice*l: 8 mm. long;

Calyx: 6 mm. long; sepals narrow-ovate, acuminate;

Corolla: tubular, 3.5 cm. long; *tube* cylindrical, 3 cm. long, 1.2 cm. in diameter near the base, 1.7 cm. in diameter at the apex, gradually passing into 5 short triangular acuminate *lobes*, which slightly curve outwards; sinuses acute, somewhat recurved; outer surface of entire corolla scabrous, mottled reddish-purple; inside base of tube velvety, dark maroon, with a raised *annulus* 5 mm. above the base, densely covered with small conical papillae, the part above the annulus densely covered with elongate conical papillae, 1 mm. long, which bear 1 to 2 setae, 1 to 1.5 mm. long; towards the mouth of the tube and on the lobes the papillae diminish in size, the setae disappear, while the color changes from dark maroon to creamy-yellow spotted with red;

Outer corona: flatly conical, circular at the base;

Inner corona: lobes 3 mm. long, geniculate at the base, with 5 finger-like processes somewhat inflexed over the staminal column; tips slightly recurved, tuberculate, tinged with maroon.

Type locality: Southern Rhodesia: Wankie.

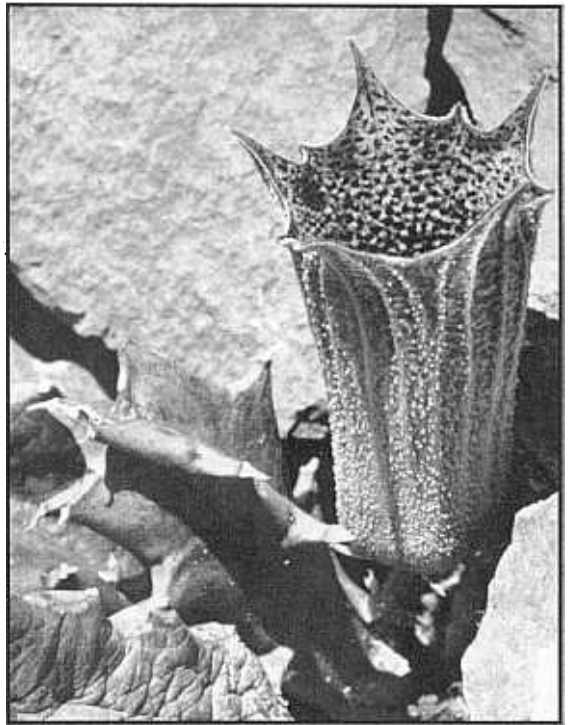
Distribution: Also recorded from Northern Rhodesia: near Broken Hill.

FIG. 990

Huernia levyi Obermeijer x 2.

Photo by Herbert Lang from the type plant, from Wankie, Southern Rhodesia.

This deep-tubed *Huernia* is named for its discoverer, B. Levy, of Wankie, Southern Rhodesia. Mr. Levy collected it about 1932 at the Wankie clay pits, where it was growing on clay formation, sheltered by trees and shrubs. It is easily distinguished from other *Huernias* by the structure of the long corolla-tube, which passes gradually into five very short lobes. "It is a species," says Miss Obermeijer, "that has developed an ingenious machinery for retaining little insects, and the inside of the tube is highly specialized. The base forms a velvety cavity and above it there is a constriction or raised annulus, not visible from outside, which bears numerous small conical papillae. Above this rim there are some larger elongated conical papillae, with one or two bristles at their tips. Towards the mouth of the tube these papillae become smaller and the bristles disappear."



Mr. Levy writes us that the plant does not grow well in cultivation in the open, unless frequently watered, when it will grow to over a foot tall and become very luxuri-

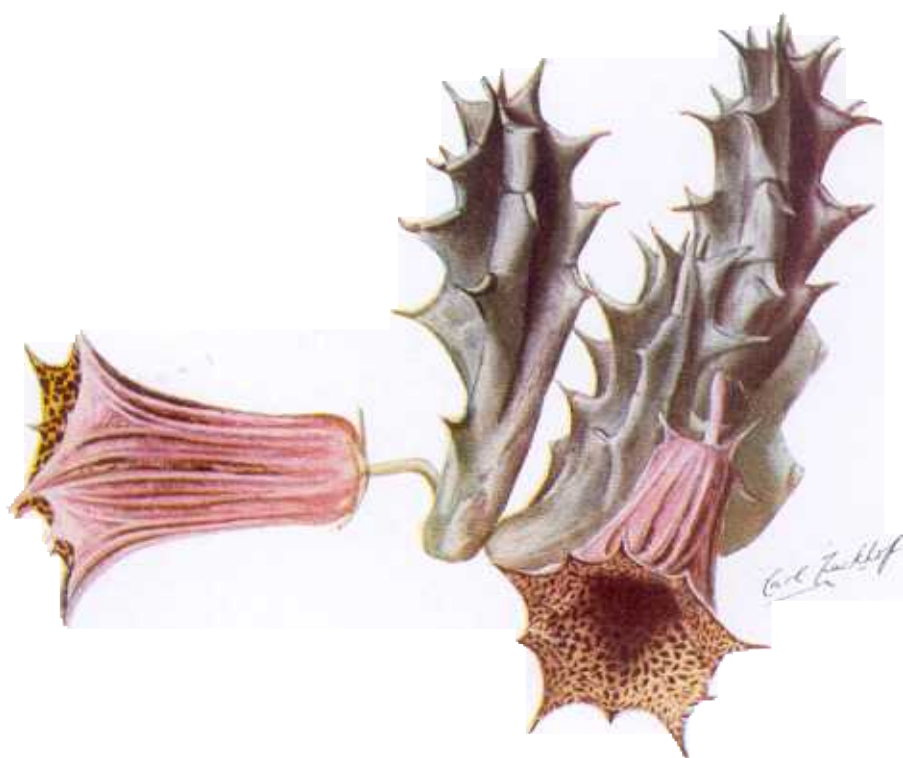


PLATE XXVIII.

Huernia levyi Obermeijer

From an original water color drawing by Carl Luckhoff.



FIG. 991

Huernia levyi
Obermeijer

From the original water
color drawing by Miss
Cythna Letty for the
Flowering Plants of South
Africa, 1936.

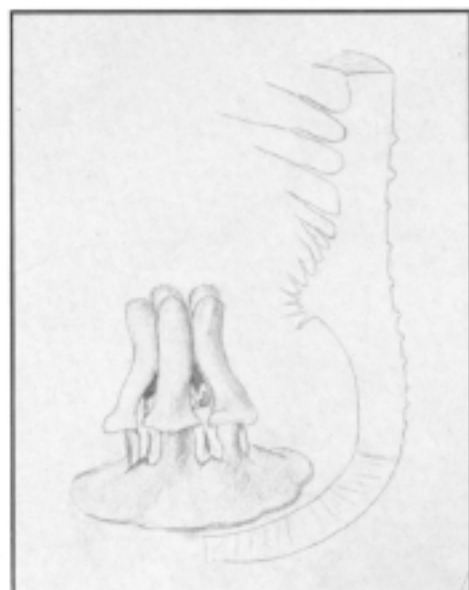


FIG. 992

Huernia levyi Obermeijer

Enlargement of the corona, with part of wall of corolla-
tube in longitudinal section showing the annulus, from
a drawing by Miss Cythna Letty for the Flowering Plants
of South Africa, 1936.

ant, without suffering at all from the application of extreme watering. We believe the plants shown in Figs. 993 and 996, collected by Mr. Tapscott in Northern Rhodesia, are the same species and, if this is the case, its range is probably much more extended than is yet known.

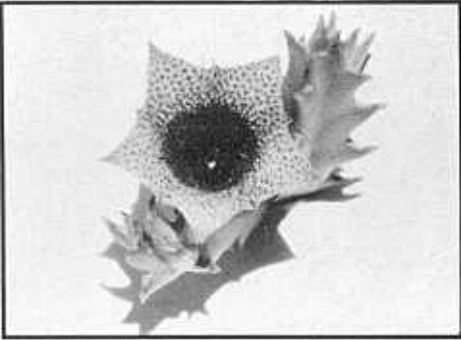


FIG. 993

Huernia levyi Obermeijer

Photo by S. Tapscott of a flowering stem from Broken Hill, Northern Rhodesia. The identification is uncertain.

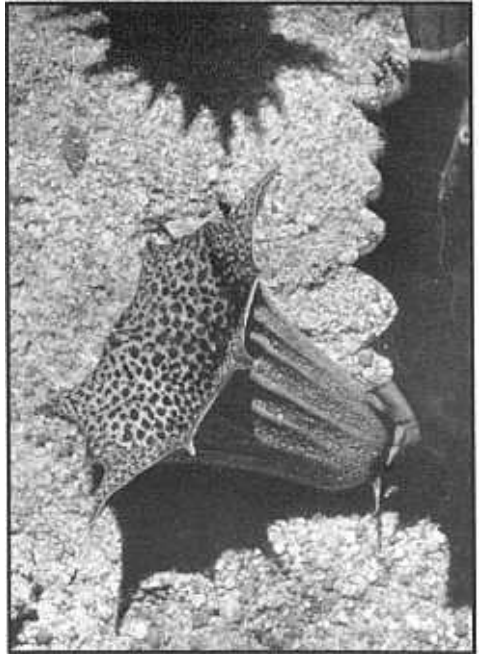


FIG. 994

Huernia levyi Obermeijer x 1.25

Photo by Dr. J. Luckhoff.



FIG. 995

Huernia levyi Obermeijer

Photo: G. W. Reynolds, Johannesburg.

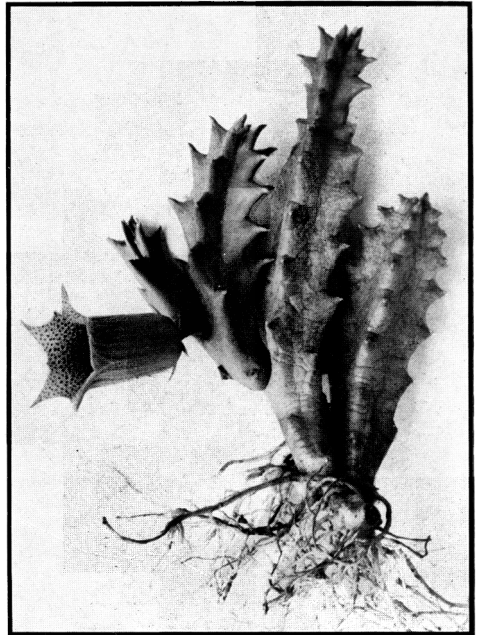


FIG. 996

Huernia levyi Obermeijer

Photo by S. Tapscott of a plant from Broken Hill, Northern Rhodesia. The identification is uncertain.

36. *Huernia longituba* N. E. Brown, Flora Cap., iv. i. 912. 1909.

(Description by Dr. Brown, l.c.):

Stems: tufted, erect, $\frac{3}{4}$ to 2 in. long, $\frac{1}{3}$ to $\frac{3}{4}$ in. thick, excluding the teeth, sharply 4 to 5-angled, glabrous, light green, sometimes tinted with purple, scarcely glaucous;

Flowers: 1 to 3 together at the lower part of the young stems, opening successively;

*Pedice*l: $\frac{1}{2}$ to $\frac{3}{4}$ in. long, $\frac{3}{4}$ lin. thick, glabrous;

Sepals: about $\frac{1}{3}$ in. long, subulate from an ovate base, glabrous;

Corolla: campanulate, prominently 20-nerved on the glabrous smooth outside, inside (except at the base) covered with short stiff conical processes, decreasing in size towards the tips of the lobes, creamy-yellow, spotted with purple, the spots becoming very crowded and darker purple at the middle part of the tube (*Pillans*), basal part smooth and whitish, with transverse dark purple (or blood-red?) lines, the processes tipped with dark purple; *tube* $\frac{3}{4}$ to $\frac{7}{8}$ in. long, $\frac{3}{4}$ in. in diameter at the mouth; *lobes* about 5 lin. long and broad, erectly spreading in a continuous line with the tube, deltoid, very acute, the alternating teeth at the sinuses very prominent;

Outer corona: 5-lobed, blackish-purple; lobes about $\frac{3}{4}$ lin. long, ovate, obtuse at the shortly bifid apex;

Inner corona: lobes $1\frac{1}{2}$ lin. long, subterete, erect, connivent at the middle, with recurving slightly clavate obtuse tips, apparently blackish-purple or dark purple-brown.

Type locality: Cape Prov.: Griqualand West: Herbert Distr.: near Douglas.

Distribution: Cape Prov.: Griqualand West: Herbert Distr.: also near Campbell; and near Mazelsfontein; Barkly West Distr.: Warrenton; Hay Distr.: Read's Drift; Paardeberg Mountains; Bechuanaland: Kuruman Distr.: 9 miles east of Kuruman; Aliwal North Distr.: near Aliwal North; Bechuanaland Protectorate: near Molepolole.

Dr. R. Schlechter once stated that the corolla-tube of *Huernia loeseneriana* was

longer than that of any other *Huernia*, but this was before the discovery by Mr. Pillans near the Vaal River, the southern boundary of Griqualand West, of *H. longituba*, and now in turn the tube of this species is surpassed by that of the new *H. levyi*. But the "long-tubed *Huernia*" will always remain well named, for its large flowers, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches in diameter, have a central tube sometimes nearly an inch in depth.

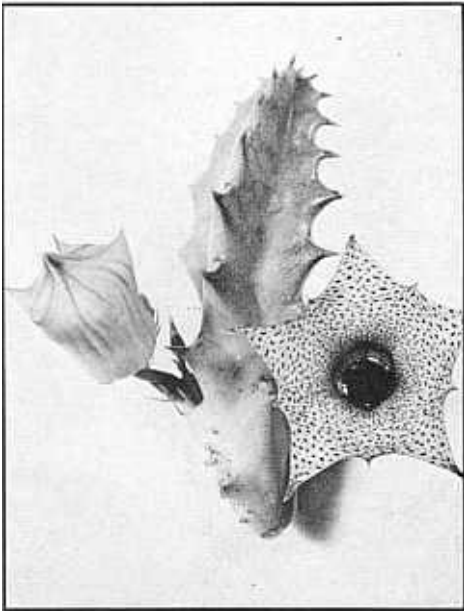


FIG. 997

Huernia longituba N. E. Brown x 1.

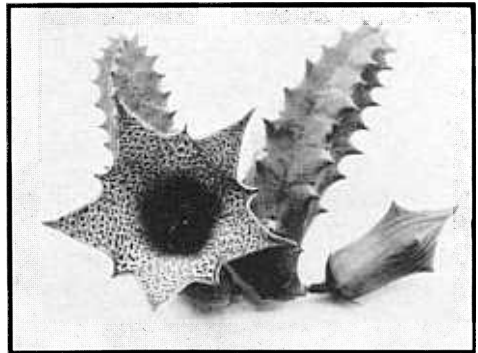


FIG. 998

Huernia longituba N. E. Brown x 0.75
Photo by S. Tapscott.

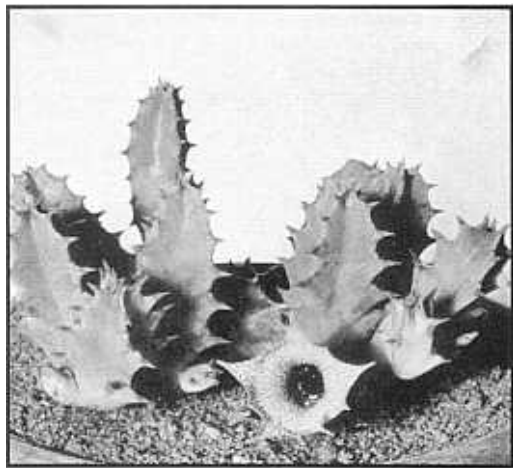


FIG. 999
Huernia longituba N. E. Brown x 0.75

The tube is lined half-way down, as are the lobes, with stiff papilla-like processes, which are doubtless associated with the capture or retention of pollen-bearing insects. Dr. Marloth may well have had *H. longituba* in mind when he wrote of the genus *Huernia* in general: "It is another kind of prison-flower, which attracts flies that can enter on the wing, but cannot escape until the barrier has wilted during the second stage of the flower's life."

Mr. Reynolds writes us that *H. longituba* usually prefers "rocky slopes wedged in among rocks, but at Kuruman in Bechuanaland I found it under bushes in stony ground. I have never seen it in pure sand, such as *Huerniopsis decipiens* prefers."

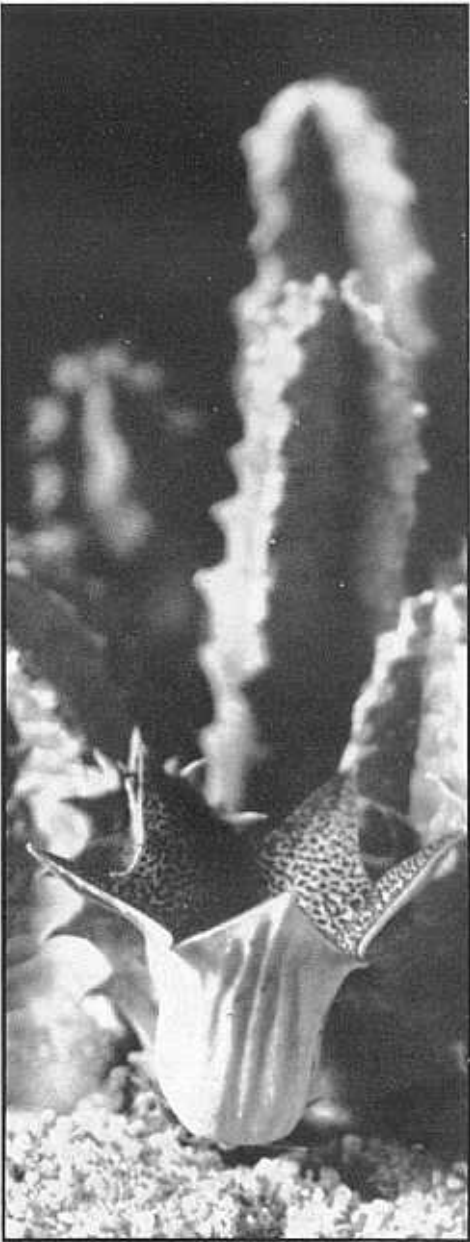


FIG. 1000
Huernia longituba N. E. Brown x 2.
Photo by Carl Luckhoff.

37. *Huernia bicampanulata* Verdoorn, Flow. Pl. So. Afr., t. 449. 1932.

(Description by Miss I. C. Verdoorn, l.c.):

Stems: 10 to 12 cm. long, 3 cm. in diameter, including the teeth, sharply 4-angled, deeply toothed on the margins, glabrous; teeth deltoid-acuminate;

Flowers: (probably) solitary from the base of the stems;

*Pedice*l: 3 to 3½ cm. long, terete, glabrous;

Sepals: 6 mm. long, lanceolate, acuminate;

Corolla: tube twice campanulate, 3 to 3½ cm. in diameter at the mouth, ribbed without and slightly spotted with red, glabrous without; lower portion of tube 2 cm. long, 1½ cm. in diameter, dark purple-red within, densely papillose at the throat; upper portion of tube pale yellow, spotted with liver-red; lobes 2 cm. long, 3 cm. broad at the base, ovate, acuminate; the alternating teeth distinct but shorter than the corolla-lobes;

Outer corona: almost black, closely appressed to the base of the corolla-tube; lobes 2 mm. long, 3 mm. broad, truncate, crenate, velvety;

Inner corona: lobes 3 mm. long, dark purple-red, erect, produced beyond the anthers and diverging above, slightly thickened above, shortly hirsute on the thickened part.

Type locality: Transvaal: Pietersburg Distr.: Farm Naauwpoort, on the road from Pietersburg to Lydenburg.

Distribution: Also in Lydenburg Distr.; Bechuanaland Protectorate: Kalahari Desert.

Discovered by G. van Son about 1931 on kopjes about 30 miles south of Pietersburg, Transvaal, growing among loose boulders and also on the flat between stones under thorn trees. Individual clumps were as large as 1 foot in diameter. According to Miss Verdoorn, "this beautiful *Huernia* is most nearly related to *H. kirkii*. The main point of difference is that in *H. bicampanulata* the limb and lobes are erect, forming with the tube two distinct campanulate portions; in *H. kirkii* the limb and lobes are horizontal. This condition is forecasted in the bud, which in the former species has the corolla-teeth erect, while in the latter species they are horizontal. In *H. bicampanulata* also the diameter of the mouth of the tube is much greater than in *H. kirkii*. The base of the corolla-tube in *H. kirkii* is banded, while in *H. bicampanulata* it is of a uniform maroon color. The stems of the latter are also more robust than those of the

former." It should be noted also that the stems of *H. bicampanulata* are always 4-angled, and can thus readily be distinguished from those of *H. kirkii*, which have 5 angles.

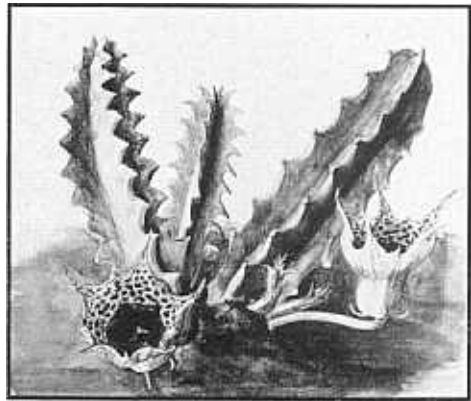


FIG. 1001

Huernia bicampanulata Verdoorn x 0.5
From the original water color drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1932.

38. *Huernia kirkii* N. E. Brown, *Flora Cap.*, iv. i. 920. 1909.

(Description by Dr. Brown, l.c.):

Stems: decumbent at the base, about 1 to $1\frac{1}{2}$ in. long, $\frac{1}{2}$ to $\frac{2}{3}$ in. in diameter, including the teeth, acutely 5-angled, glabrous; teeth 1 to $1\frac{1}{3}$ lin. long, stout, deltoid, acute, slightly recurved;

Flowers: 1 to 4 together at the base of the young stems, developed successively;

Bracts: $1\frac{1}{2}$ to 2 lin. long, subulate or lanceolate-subulate, glabrous;

Pedicel: $\frac{1}{2}$ to $\frac{2}{3}$ in. long, glabrous;

Sepals: 5 to $5\frac{1}{2}$ lin. long, very spreading, $1\frac{1}{3}$ lin. broad at the ovate base, whence they taper into long subulate points, glabrous;

Corolla: $1\frac{3}{4}$ to 2 in. in diameter; *tube* of a dried flower about $\frac{1}{2}$ in. long, but according to Mr. Kirk's drawing about $\frac{3}{4}$ in. long and 1 in. in diameter outside, subglobose-campanulate, constricted at the mouth; *limb* saucer-shaped, lobed to half-way, very abruptly spreading from the tube, with suberect deltoid lobes, tapering into subulate points, according to the drawing about $\frac{3}{4}$ in. long; outside glabrous; inside smooth and glabrous in the lower part of the tube, densely covered with erect fleshy subulate processes $\frac{1}{2}$ to $\frac{3}{4}$ lin. long in the throat and around the mouth of the tube, minutely papillate towards the margins, otherwise glabrous, marked with "irregular red spots" (*Kirk*);

Outer corona: 5-lobed; lobes subquadrate, obtusely 2-lobed at the apex;

Inner corona: lobes $1\frac{1}{2}$ to $1\frac{3}{4}$ lin. long, very much exceeding the anthers, subterete, slightly clavate at the minutely papillate recurving apex, with a transverse ridge at the base;

Staminal column: 1 lin. long; style-apex concave.

Type locality: Transvaal: Barberton Distr.: Komatipoort.

Distribution: Also on shales near Barberton; Southern Rhodesia: near Bulawayo.

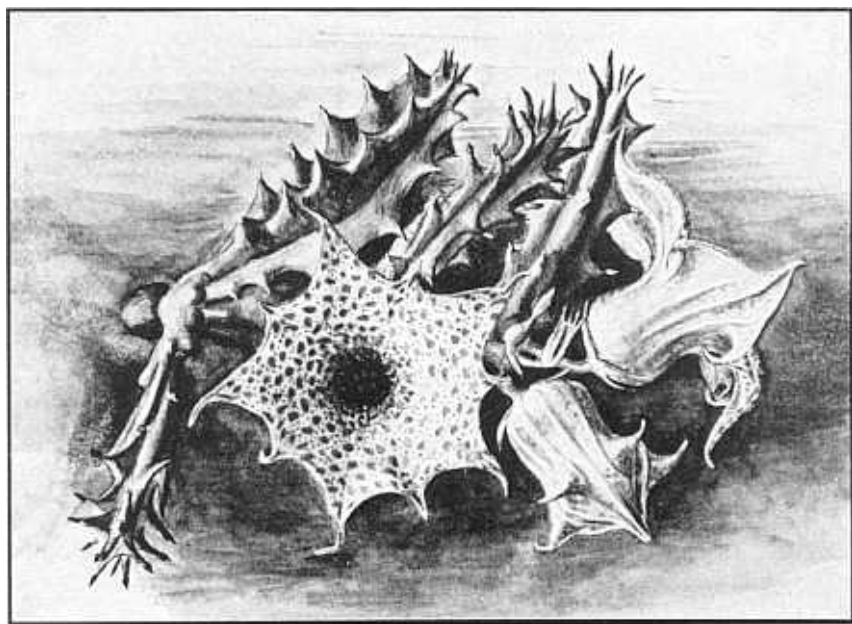


FIG. 1002

Huernia kirkii N. E. Brown x 1.

From the original water color drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1932.



XXIX

Huernia kirkii
original

Brown
drawing by Carl Luckhoff

A beautiful species, named for Lieut. J. W. C. Kirk, son of Sir John Kirk, who first discovered it near the Komati Gold Fields in the Transvaal. The flower buds are striking: the main corolla tips form an acute cone, while in between the smaller intermediate *Huernia* teeth project horizontally and very prominently. The flowers are as much as 2 inches in diameter, the deeply campanulate tube much swollen, the corolla-lobes very spreading and the intermediate tips unusually large. The color is sulphur-yellow with maroon spots, passing into lines in the tube, the size of the spots somewhat variable. The tube is covered to its mouth with fleshy papillae, many tipped with minute crimson cells. While *H. kirkii* is rather rare in the wild state, it grows freely in cultivation and is a free bloomer. It is one of the most desirable of all *Huernias* for the collector.

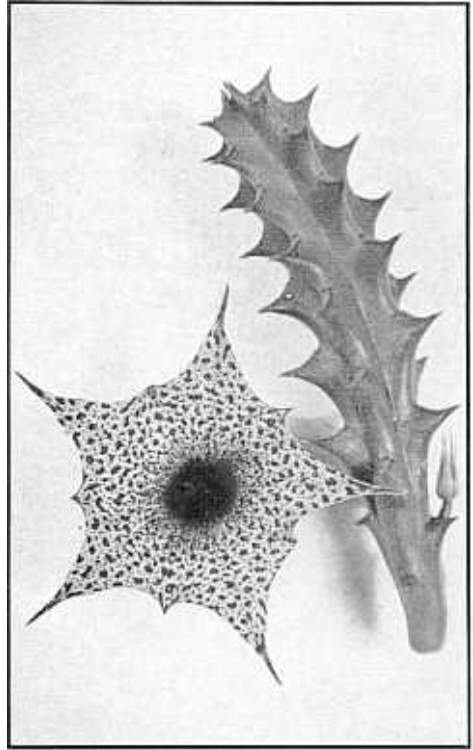


FIG. 1003

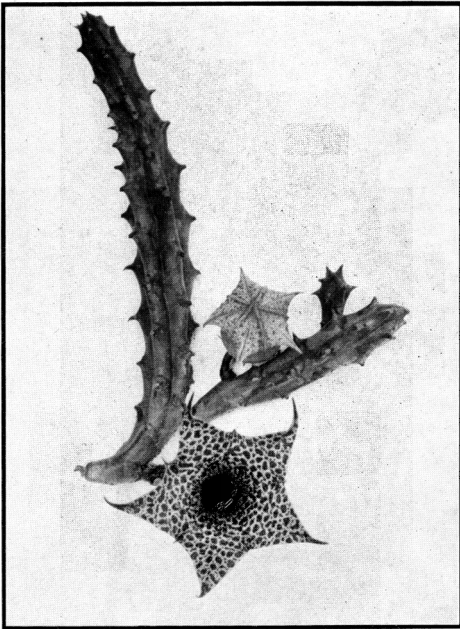
Huernia kirkii N. E. Brown x

FIG. 1004

Huernia kirkii N. E. Brown x 0.5

From neighborhood of Bulawayo.
Photo by S. Tapscott.



FIG. 1005

Bud of *Huernia kirkii* N. E. Brown x 1.2

39. *Huernia hislopiae* Turrill, Kew Bull., 30. 1922.

(Description by Dr. W. B. Turrill, l.c., translated from the Latin):

Plant: branching from the base; *stems* 5 cm. high, 1 cm. thick, green at the base, purplish above, glaucous, glabrous, 5-angled; the angles with teeth 3 mm. long;*Flowers*: solitary;*Pedicel*: 6 mm. long, glabrous;*Sepals*: lanceolate-subulate, acuminate at the apex, 6 mm. long, glabrous;*Corolla*: campanulate; *tube* 16 mm. long, slightly swollen below, constricted above, white outside, with dark blood-red lines inside, 11 mm. in diameter at the mouth, with subclavate papillae white and tawny blood-red at the apex; *limb* with 5 lobes, cream-colored with many tawny blood-red spots; *lobes* deltoid-acuminate, 14 mm. long, papillose, somewhat reflexed, the intermediate teeth 3 mm. long, 2 mm. broad at the base, reflexed;*Outer corona*: of 5 oblong lobes 4 mm. long, 3 mm. broad, dark blood-red and almost black, truncate at the apex, shortly 3 to 4-toothed;*Inner corona*: lobes subulate, 4 mm. long, connivent half-way, diverging above, white, with the apex dark blood-red.

Type locality: Rhodesia: without precise locality.

Distribution: Southern

Rhodesia: common on kopjes around Salisbury; frequent in Sabi Valley; on hills between Umvuma and Fort Victoria; and near Zimbabwe.



FIG. 1006

Huernia hislopiae Turrill
x 1.2

Photo by Herbert Lang of a plant collected by the Vernay-Lang Kalahari Expedition, near Zimbabwe Ruins, Southern Rhodesia, 1930.

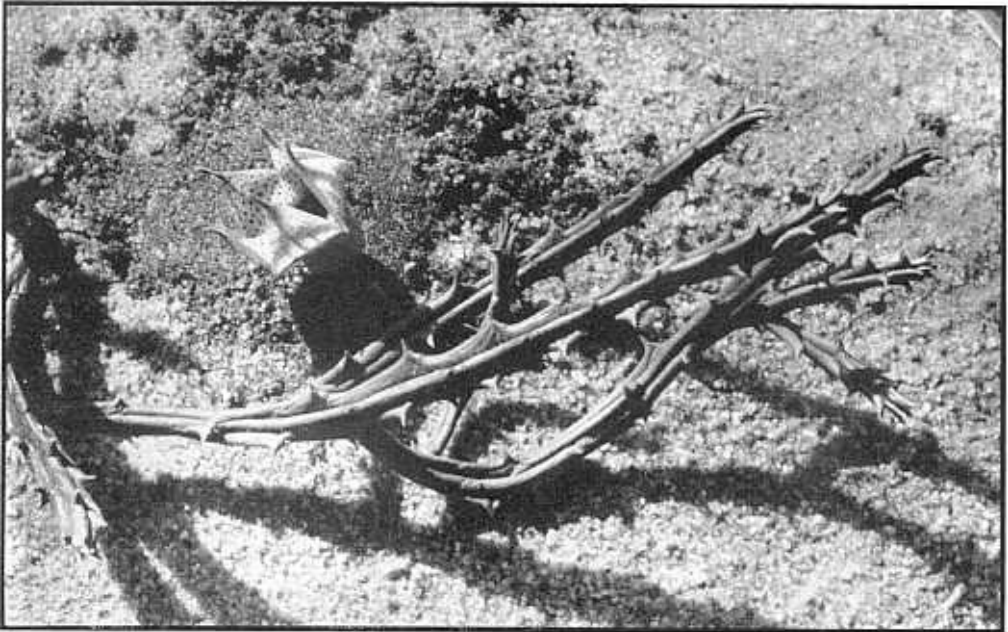


FIG. 1007. *Huernia hislopii* Turrill x 1. Photo by Carl Luckhoff.

This tropical species was discovered about 1920 by Mr. Hislop, for whom it is named. It was the first *Huernia* described from the Rhodesias and is a relatively common plant in the eastern half of Southern Rhodesia, from Salisbury to below Fort Victoria. It is readily distinguished from all other *Huernias* by its thin fluted stems. The flowers are most nearly related to *H. barbata*. They differ in having the inner surface of the corolla-tube equipped with whitish papillae tipped with blood-red spots, but without the long hairs of *H. barbata*; the corolla-lobes very much reflexed; and the outer corona-lobes much narrower than those of *H. barbata*. One might say that the flowers suggest the "bearded *Huernia*" after a shave.



FIG. 1008
Huernia hislopii Turrill

Longitudinal section of a flower from the plant shown in Fig. 1006. Photo by Herbert Lang.

40 *Huernia campanulata* (Masson R. Brown, Mem. Wern. Soc*Stapelia campanulata* Masson, Stap. N

(Description by Dr. N. E. Brown, F

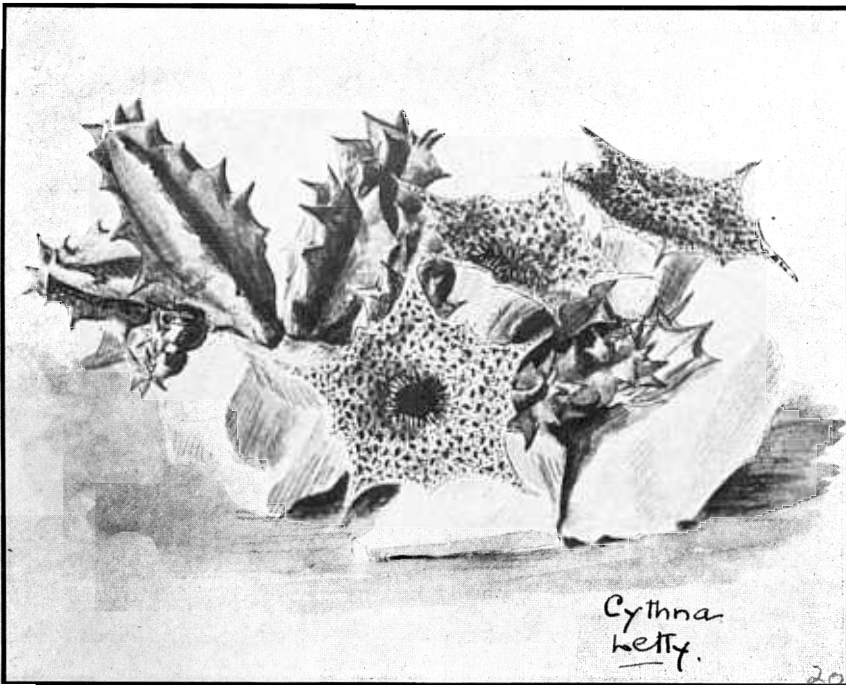
Stems: erect, $1\frac{1}{2}$ to 5 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. thick, acutely 4 to 5-angled, green or mottled with purplish; angles compressed, with spreading deltoid acute teeth 1 to 2 lin. long;*Flowers:* 2 to 3 together near the base of the young stems, developing in succession;*Pedice:* 3 to 6 lin. long, glabrous;*Sepals:* narrowly lanceolate, acuminate, glabrous;*Corolla:* somewhat pear-shaped and obtusely pentagonal in bud, with a short acute point and small conical tooth at each angle; when expanded, about $1\frac{1}{2}$ in. in diameter, campanulate with a slight contraction at the middle, thence gradually passing into the broadly funnel shaped limb and spreading lobes; outside smooth, pale greenish, spotted with purple; inside minutely papillate, bearded with stiff clavate purple hairs at the throat of the tube, whitish or pale sulphur-yellow, marked with raised blackish-purple or blackish-crimson spots, passing into transverse lines in the tube, which is entirely dark purple at the base; lobes 5 to 6 lin. long and about as broad at the base, deltoid, acuminate;*Outer corona:* lobes much broader than long, subtruncate, emarginate, blackish, shining;*Inner corona:* lobes subulate, acute, connivent over the style-apex, with recurved tips, slightly gibbous on the back at the base, dark purple

Type locality: South Africa: without locality.

Distribution: Cape Prov.: Prince Albert Distr.: at Zeekoegat, 36 miles east of Prince

All

1 Oud



R. Br

wing

Cythr

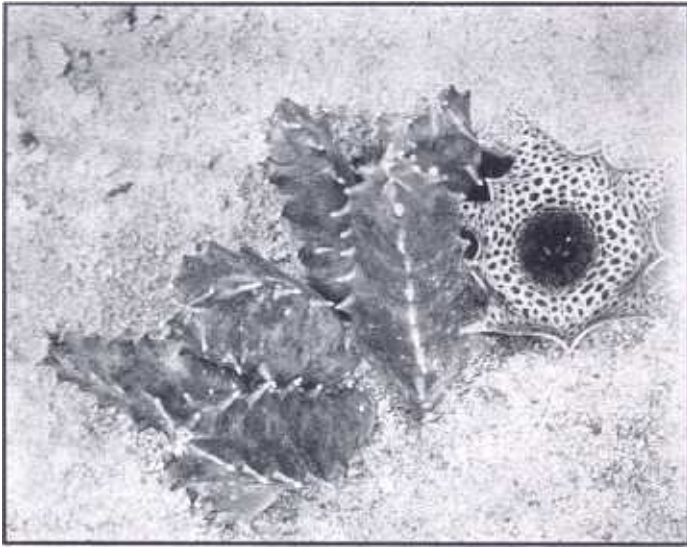


FIG. 1010

Huernia closely related to *H. campanulata*, if indeed it does not actually represent that species. Photo by S. Tapscott.

Collected by Masson, as he tells us, in dry places in South Africa, doubtless in the Great Karroo, for it was rediscovered about 1930 by G. J. de Wyn near Prince Albert. Fig. 834, from Curtis's Botanical Magazine, 1809, shows a plant grown in the "copious collection of the late John Walker, Esq., at Stockwell." The species is well named, the "Bell-flowered *Huernia*." The large

flowers are funnel-shaped, slightly contracted at the centre, with a broad limb and pointed lobes.

H. campanulata is the type for a series of species with campanulate flowers, which are as different from the small bell shapes of *H. aspera* and its allies as they are from the broad flaring annular *Huernias* of the type of *H. guttata*.

Var. a. *Huernia campanulata* var. *denticoronata* N. E. Brown, *Flora Cap.*, iv. i. 906. 1909.

The only difference from the type, according to Dr. Brown, is that the outer corona-lobes are "as long as broad, deeply

divided into two acute lobes, dark purple-brown, paler at the base."

41. *Huernia clavigera* (Jacquin) Haworth, Suppl. Pl. Succ., 10. 1819.*Stapelia clavigera* Jacquin, Stap., t. 5. 1806-19.*Stapelia campanulata* Sims, Bot. Mag., t. 1661. 1814. *Nec* Masson, 1796.*Stapelia clavata* Decaisne, de Candolle: Prodrumus, viii. 664. 1844.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 907):

Plant: about 2 (or under cultivation 2 to 4) in. high; *stems* erect or ascending, $\frac{1}{2}$ to 1 in. thick, acutely 4 to 5-angled, glabrous, dull green, often blotched with purplish where exposed to the sun; angles with stout acute horizontal teeth, 1 to 3 lin. long;

Flowers: 1 to 5 together at the base of the young stems, developing successively;

*Pedice*l: $1\frac{1}{2}$ to $7\frac{1}{2}$ lin. long, 1 lin. thick, glabrous;

Sepals: 2 to 3 lin. long, lanceolate or ovate-lanceolate, subulate-acuminate, glabrous;

Corolla: campanulate, a little contracted at the middle so as to resemble a wide-mouthed bell, $1\frac{1}{4}$ to $1\frac{1}{3}$ in. in diameter, with short slightly spreading or suberect lobes; outside prominently nerved, glabrous, pale greenish or yellowish-white; inside pale ochre-yellow or dull greenish-yellow, thickly covered with very minute dark purple-brown papillae and small blood-red spots, which in the tube become confluent into irregular blotches that nearly cover it or suddenly pass into narrow transverse lines or belts, bottom of the tube entirely blood-red, limb and throat (but not the lobes) covered with stiff outstanding clavate purple hairs; *tube* $\frac{2}{3}$ to 1 in. long; *lobes* 3 to 4 lin. long and 4 to 5 lin. broad, deltoid, acute or subacuminate;

Outer corona: 5-lobed, black, with the central part purple-brown, velvety; lobes about 1 lin. long and slightly broader, subquadrate or transverse, bifid, with obtuse teeth or rarely subequally 3-toothed, at each sinus between the lobes is a minute tooth;

Inner corona: lobes $1\frac{1}{2}$ to 2 lin. long, subulate, with a dorsal ridge at their base, connivent over the style-apex at the lower half, then diverging with erect tips; dark purple-brown.

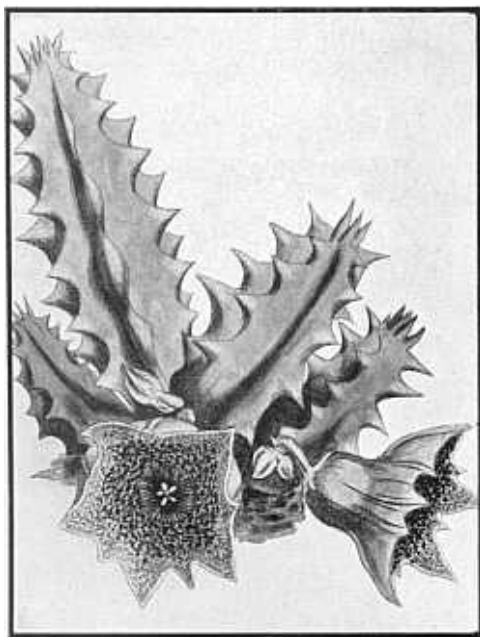


FIG. 1011

Huernia clavigera Haworth x 0.75

From a drawing by Sydenham Edwards, in Curtis's Botanical Magazine, 1814.



FIG. 1012

Huernia clavigera Haworth x 1.25

Type locality: Cape Province: without locality.

Distribution: Swellendam Distr.: Barrydale; Laingsburg Distr.: near Matjesfontein and near Witte Poort; Prieska Distr.; Little Namaqualand.

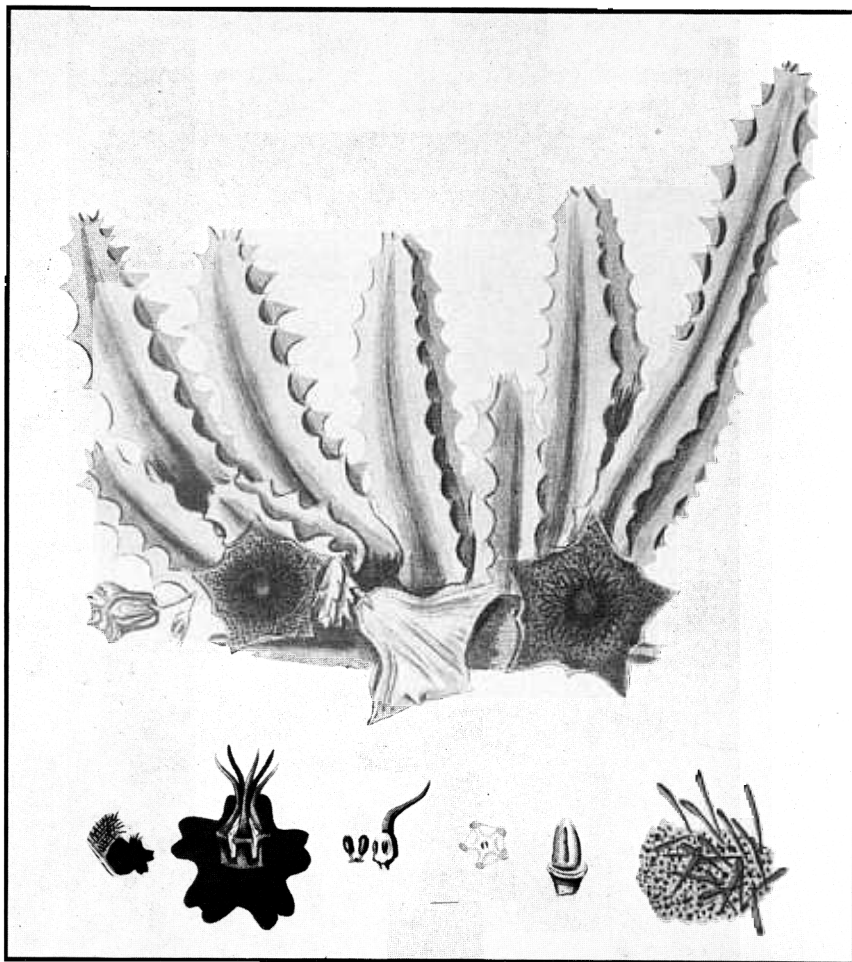


FIG. 1013

Huernia clavigera Haworth x 0.75

Jacquin: *Stapelium* Descriptiones, 1806-19.

The "club-bearing *Huernia*" is named for the stiff clavate purple hairs which cover the inner surface of the tube and the united portion of the limb. The first collection of the species is unrecorded. It was first described by Jacquin in his wonderful book on the *Stapelias* in the Imperial Gardens at Schönbrunn, and was in general cultivation early in the 19th century. The specimen figured in the Botanical Maga-

zine for 1814 was grown at "Mr. Vere's" and the editor, Dr. John Sims, added: "We received the same from Mssrs. Loddiges some years ago." In more recent times it has been collected at widely separate points between Matjesfontein and Little Namaqualand. Dr. Sims confused the species with *Huernia campanulata*, from which, however, it differs in several respects. The corolla is not spotted with purple outside;

inside it is spotted with crimson instead of blackish-purple; and the clavate hairs in the tube and on the limb are very prominent. They seem rather to recall *H. barbata*, but the corolla-lobes are only half as long as in that remarkable species.

Var. a. *Huernia clavigera* var. *maritima* N. E. Brown, *Flora Cap.*, iv. i. 908. 1909.

(Description by Dr. Brown, l.c.):

Stems: $1\frac{1}{2}$ to 2 in. high, 4 to 6 lin. thick, acutely 5-angled, light green, somewhat glaucous

Outer corona: ring-like, irregularly and minutely toothed (not lobed) at the margin, black;

Otherwise as in the type.

Type locality: Cape Prov.: Mossel Bay Distr.: near Mossel Bay.

Distribution: Not further known.

This variety, named for its habitat near the southern seaboard, was discovered in 1907 by Charles Eustace Pillans. Dr. Brown suggested that it might prove to be a distinct species, but aside from the unusual outer corona it seems closely to follow the type.

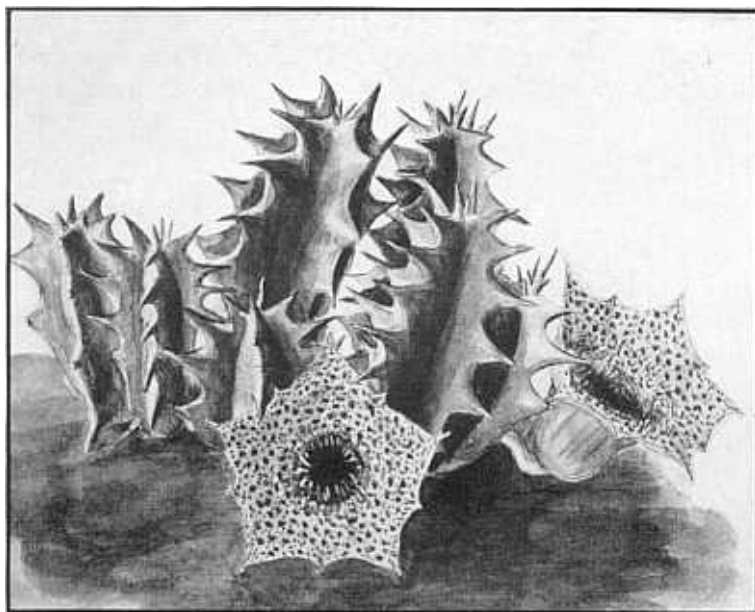


FIG. 1014

Huernia barbata Haworth x 0.75

From the original water color drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1932.

42. *Huernia barbata* (Masson) Haworth, Syn. Pl. Succ., 31. 1812.

Stapelia barbata Masson, Stap. Nov., 11. 1796.

Huernia crispa Haworth, Syn. Pl. Succ., 31. 1812.

Huernia barbata var. *crispa* Loudon, Hort. Brit., 202. 1830.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 906) :

Stems: erect, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. thick, acutely 4 to 5-angled, glabrous, glaucous-green; angles with spreading deltoid acute teeth $1\frac{1}{2}$ lin. long;

Flowers: 2 or more, successively developed near the base of the young stems;

*Pedice*l: $\frac{1}{4}$ to $\frac{1}{3}$ in. long, rather slender, glabrous;

Sepals: about $\frac{1}{4}$ in. long, lanceolate-subulate, glabrous;

Corolla: acutely pointed and pentagonal in bud; when expanded $1\frac{1}{4}$ to 2 in. in diameter, campanulate, with ascending-spreading or gradually recurving lobes, glabrous and without spots outside, clear or dirty sulphur-yellow to pale buff on the inside, marked on the lobes and upper part of the tube with blood-red dots, which pass into transverse interrupted lines on the lower part of the tube, covered from the middle of the tube to the base or to $\frac{2}{3}$ of the way up the lobes with long stiff clavate purple hairs, which become minute upon the lobes, each seated on a purple-brown papilla, with the tips and margins of the lobes papillate; *tube* $\frac{2}{3}$ to 1 in. long; *lobes* $\frac{1}{2}$ to $\frac{2}{3}$ in. long and nearly as broad, deltoid, acuminate;

Outer corona: 5-lobed, blackish or blackish-crimson; lobes subquadrate, emarginate or shortly and obtusely bifid;

Inner corona: lobes $1\frac{1}{2}$ to 2 lin. long, subulate, slightly gibbous at the base, connivent over the style-apex at the basal part, then divergent-ascending, with suberect tips, purple.

Type locality: South Africa: without locality.

Distribution: Orange Free State: Fauresmith; Cape Prov.: Prieska Distr.; Aliwal North Distr.; Lady Grey Distr.: 14 miles south-east of Lady Grey; Albert Distr.: near Burg-

hersdorp; Somerset East Distr.: near Sheldon; Colesberg Distr. ? : "from the Karroo towards Colesberg;" Ladismith Distr.: near Ladismith; Uitenhage Distr.: Sundays River, north of Uitenhage; Willowmore Distr.: between Willowmore and Port Elizabeth; Albany Distr.: near Cradock Road, a few miles from Grahamstown.

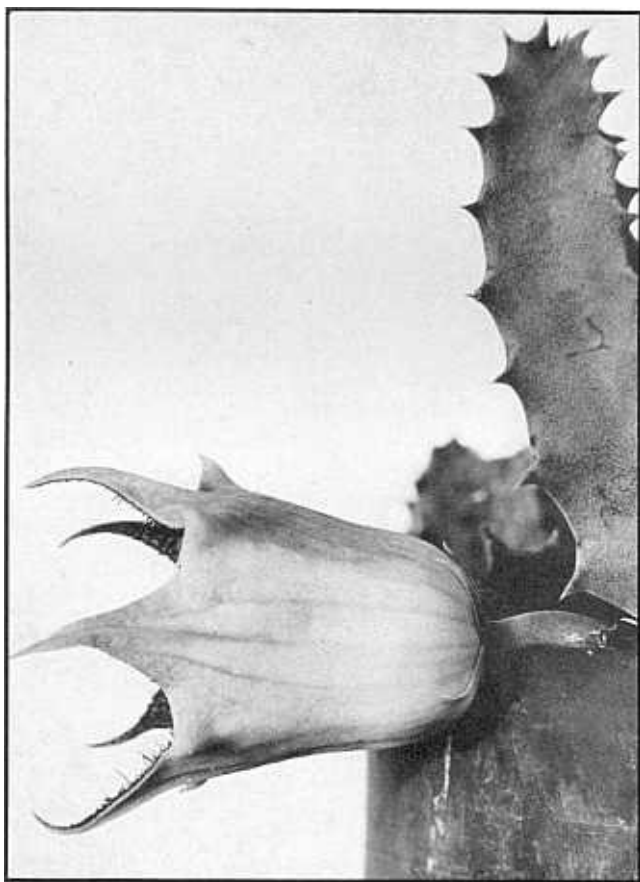


FIG. 1015

Huernia barbata Haworth x 1.5

Francis Masson was often very happy in his choice of names for his Stapeliads. His designation of the present species, which flowered in his little garden at the Cape in 1794, as the "bearded Stapelia" (or *Huernia*, as it is now called), is a typical instance of this careful sense for nomenclature. Once the flower has been seen (with its papillate inner corolla surface, and the papillae tipped with long clavate purple hairs from below mid-tube to the base or

even the middle of the lobes), the name *H. barbata* will never be applied by the collector to any other plant. It is as aptly chosen to tell a complete story in one word as is *Stapelia pulvinata* to describe the wonderful hair-cushions in the flowers of that species, or *Caralluma ramosa* to bring to mind one of the most branching of all Stapeliads.

Huernia barbata, with its two varieties, has a wide range from the Orange Free



W. F. Barker

PLATE XXX.

Haernia barbata Haworth

From an original water color drawing by Miss W. F. Barker.

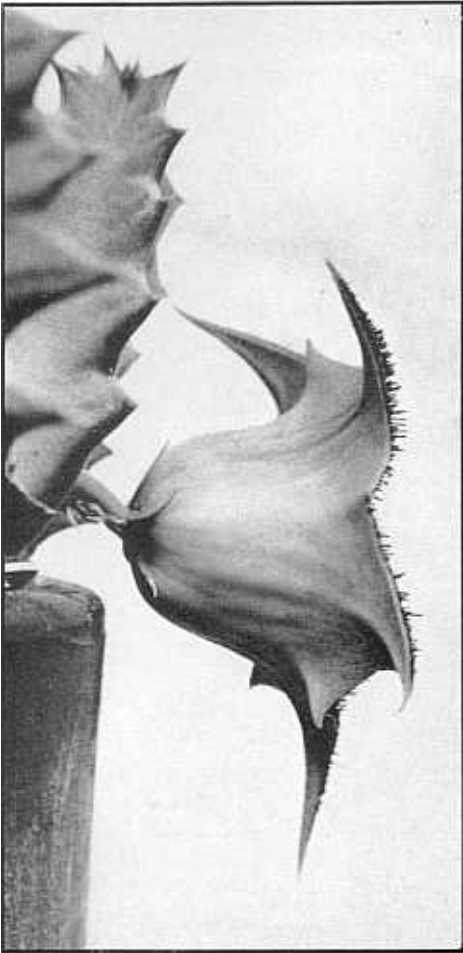


FIG. 1016
Huernia barbata Haworth x 5

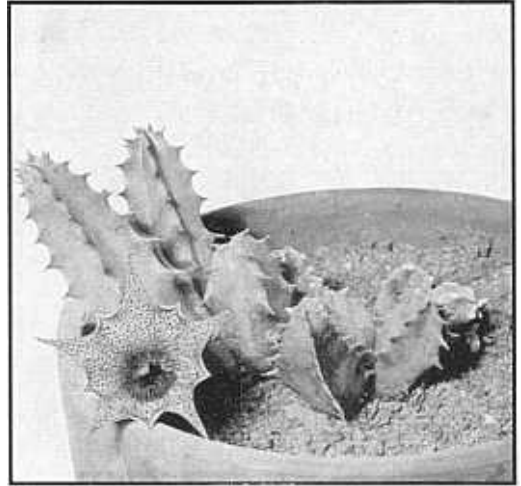


FIG. 1017
Huernia barbata Haworth x 0.75

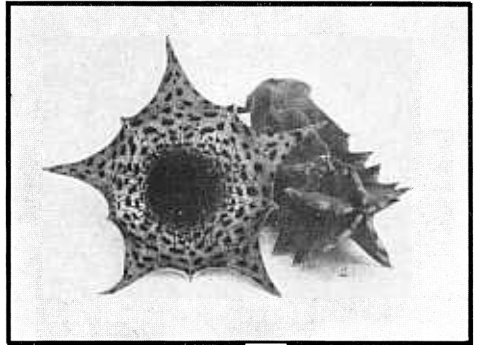


FIG. 1018
Huernia barbata Haworth x 0.75
Photo by S. Tapscott.

State and Griqualand West south to Ladismith and Uitenhage. G. W. Reynolds writes that he has collected it on the summit of a spur of the Wittebergen, in Lady

Grey district, growing at 6,200 feet elevation in a locality which is often all snow-covered in winter. He adds: "I never knew that any Stapeliads grew in such habitats!"

Var. a. *Huernia barbata* var. *griquensis* N. E. Brown, *Flora Cap.*, iv. i. 907 1909.

(Description by Dr. Brown, l.c.):

Stems: not seen;

Corolla: tube of dried flower about $\frac{1}{2}$ in. long; lobes about 5 lin. long and $3\frac{1}{2}$ to 4 lin. broad at the base, narrowly deltoid, very acuminate; clavate hairs much less numerous than in the type, thinly scattered about the middle part of the corolla and not nearly extending up to the base of the lobes;

Outer corona: with 5 subquadrate lobes $\frac{2}{3}$ lin. long and nearly as broad, acutely bifid; Otherwise as in the type.

Type locality: Cape Prov.: Griqualand West: "Diamond Fields."

Distribution: Hay Distr.: Postmasburg.

The "Griqualand variety" was discovered by Mr. Tuck about 1875.

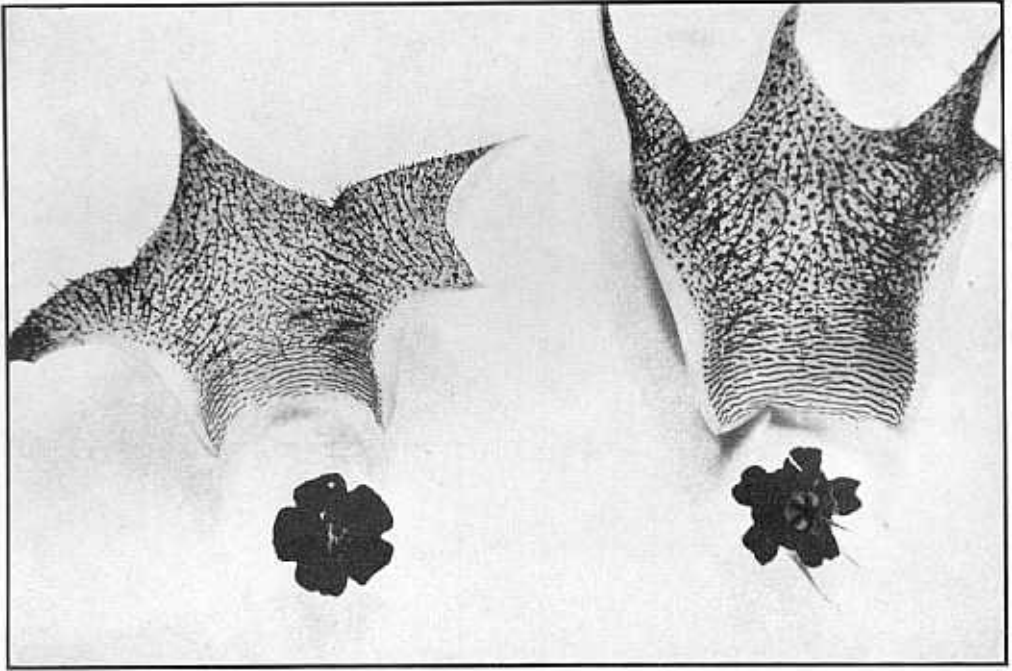


FIG. 1019

Huernia barbata Haworth
Section of corolla, and corona.

Var. b. *Huernia barbata* var. *tubata* (Jacquin) N. E. Brown, *Flora Cap.*, iv. i. 907. 1909.

Stapelia tubata Jacquin, *Stap.*, t. 3. 1806-19.

Stapelia duodecimfida Jacquin, *Stap.*, t. 4. 1806-19.

Huernia tubata Haworth, *Syn. Pl. Succ.*, 30. 1812.

Huernia duodecimfida Sweet, *Hort. Brit.*, 2 Ed., 359. 1830.

Huernia tubata var. *duodecimfida* G. Don, *Gen. Hist.*, iv. 113. 1838.

Stapelia tubulosa Hort., ex Steudel: *Nom. Bot.*, 2 Ed., ii. 632. 1841.

(Description by Dr. Brown, l.c.):

Outer corona: subequally 10-crenate or obscurely and very broadly 5-lobed, with the lobes rounded or emarginate;

Otherwise as in the type.

Type locality: Unknown.

Distribution: Unknown.

This variety differs from the type only in the form of the outer corona. It was first observed about 1800 in the Imperial Gardens at Schönbrunn and is believed to have

been raised from seed sent to Baron de Jacquin by Georg Scholl from South Africa. Jacquin's *Stapelia duodecimfida* appears to have been based on a freak flower of this

variety with a 6-lobed corolla, which with the 6 intermediate lobes must have appeared to be 12-lobed, whence its name (*duodecim* being Latin for 12).

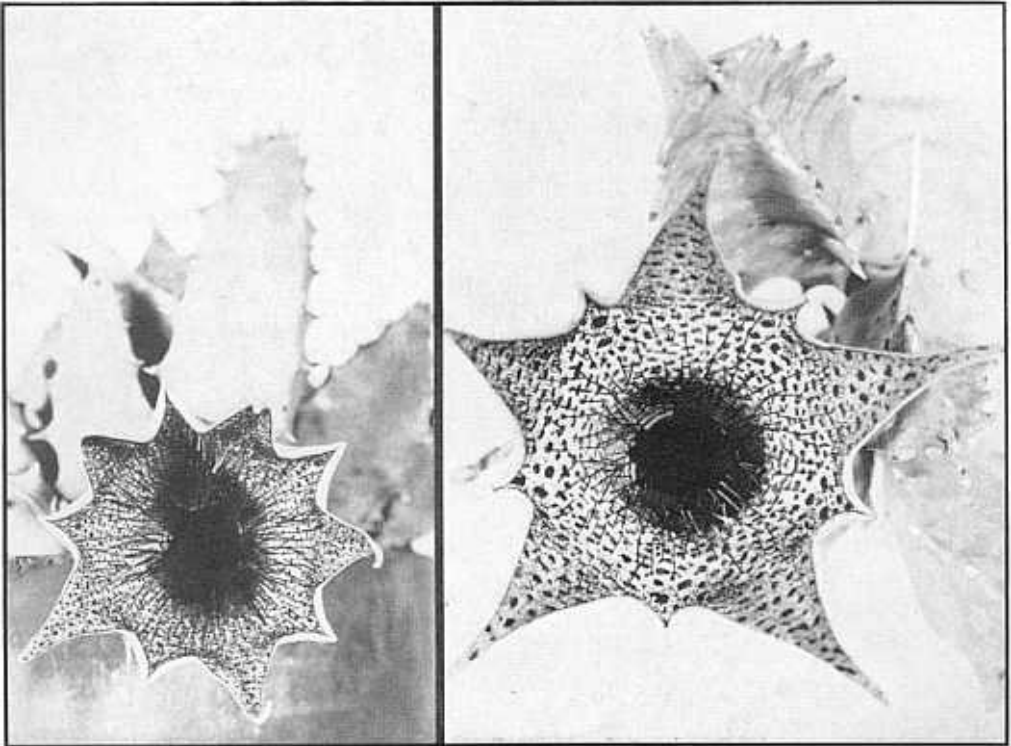


FIG. 1020

Huernia barbata Haworth

43. *Huernia distincta* N. E. Brown, Flora Cap., iv. i. 910. 1909.

(Description by Dr. Brown, l.c.):

Plant: densely tufted; *stems* erect, 2 to 3 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. thick, at first distinctly 8 to 9-angled, but with age the angles become very obtuse and scarcely prominent, formed of series of conical acute spreading teeth 1 to 2 lin. long, along the then nearly cylindric stems, glabrous, green, not glaucous;

Flowers: 1 (or probably more) at the base of the young stems;

Pedicel: $\frac{1}{3}$ to $\frac{1}{2}$ in. long, glabrous;

Sepals: 2 to 3 lin. long, lanceolate-subulate, glabrous;

Corolla: about $1\frac{1}{4}$ in. in diameter; *tube* campanulate, $\frac{1}{2}$ in. long and as much in diameter outside, $\frac{1}{4}$ in. in diameter at the mouth inside; *lobes* horizontally spreading or recurved, $4\frac{1}{2}$ to 5 lin. long and as broad at the base, much smaller in dried flowers, deltoid, very acute; outer surface glabrous; inside thickly covered from the middle of the tube to the tips of the lobes with small columnar papillae terminated by a short stiff crimson hair-point, pale dull yellow, dotted with crimson, the spots fusing into short regular or irregular and labyrinthine lines on the smooth glabrous basal half of the tube;

Outer corona: lobes $\frac{3}{4}$ lin. long, 1 lin. broad, subquadrate or transverse, subtruncate and entire to shortly bifid, with an acute notch between the rounded teeth, intense blackish-crimson;

Inner corona: lobes $1\frac{1}{2}$ lin. long, subulate, erect, connivent at the middle, with slightly spreading tips, dark purple-brown.

Type locality: Cape Prov.: Laingsburg Distr.: near Matjesfontein.

Distribution: Also collected in Laingsburg Distr.: near Whitehill.

The "distinct *Huernia*" was discovered by Mr. Pillans in 1904, who wrote of it: "It seems to me to be a natural hybrid between *H. pillansii* and *H. clavigera*, which bound it on both sides. Nevertheless it is a species well-defined." The unique stems, 8 to 9-angled when young, provide an immediate identification of the plant.

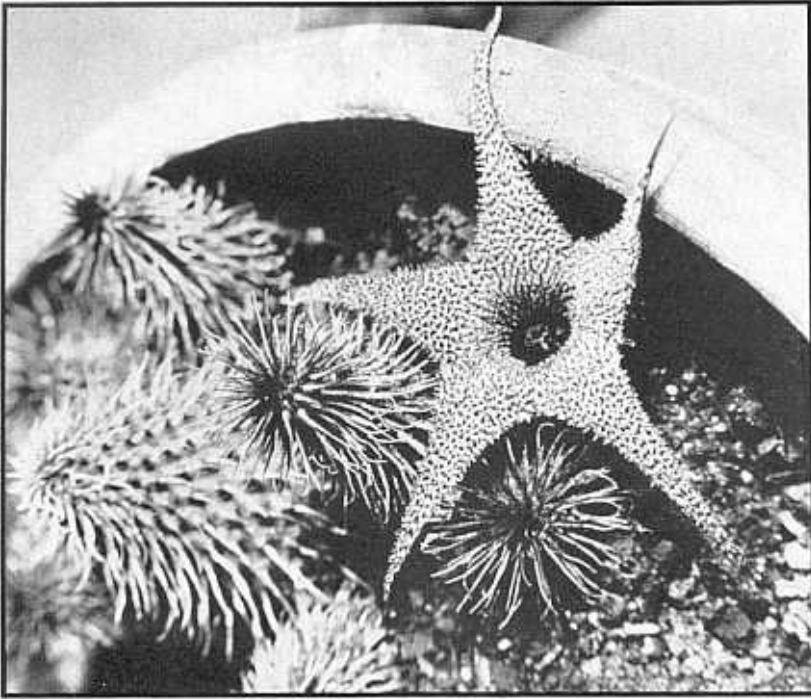


FIG. 1021

Huernia pillansii N. E. Brown x 2.44. *Huernia pillansii* N. E. Brown, Gard. Chron., xxxv. 50, false *pillansi*. 1904.

(Description by Dr. Brown, Flora Cap., iv. i. 909):

Plant: densely tufted; stems $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, $\frac{1}{2}$ to $\frac{2}{3}$ in. in diameter, erect or ascending, subglobose when young, becoming ovoid or cylindric, densely covered with conical recurved bristle-pointed tubercles $1\frac{1}{2}$ to 2 lin. long, in 20 to 24 vertical or spiral series, glabrous, green, or dull purplish where exposed to the sun;

Flowers: 1 to 3 together near the base of the young stems, successively developed;

*Pedice*l: $1\frac{1}{2}$ to 2 lin. long, glabrous;

Sepals: 2 to 3 lin. long, $\frac{2}{3}$ to 1 lin. broad, ovate-lanceolate at the base, attenuate into filiform recurving tips, glabrous;

Corolla: 1 to $1\frac{1}{4}$ in. in diameter; *tube* campanulate, about $\frac{1}{3}$ in. long and as much in diameter outside; *lobes* abruptly and horizontally spreading from the tube, recurved, 5 to 6 lin. long, 3 to $3\frac{1}{2}$ lin. broad at the base, whence they gradually taper to a fine acuminate point, glabrous outside; inner surface covered on the lobes and in the throat of the tube with small fleshy terete obtuse erect processes $\frac{1}{4}$ to $\frac{1}{3}$ lin. long, smooth in the lower part of the tube, pale yellow, becoming pinkish-cream in the tube, covered with small crimson spots and the tips of the processes also crimson;

Outer corona: 5-lobed, black or purple-black; lobes about $\frac{3}{4}$ lin. long and broad, subquadrate or oblong, very shortly and obtusely bifid to acutely bifid to the middle, when the whole appears to consist of 5 pairs of small deltoid teeth;

Inner corona: lobes about 1 lin. long, connivent-erect, with very slightly spreading tips, dorsally flattened, linear, slightly humped at the base, minutely papillate at the obtuse slightly thickened apex, dark purple-brown;

Staminal column: about $1\frac{1}{4}$ lin. long.

Type locality: Cape Prov.: Laingsburg Distr.: stony places near Matjesfontein.

Distribution: Also from Prince Albert Distr. near Prince Albert; Oudtshoorn Distr. hills near Oudtshoorn; Calitzdorp.

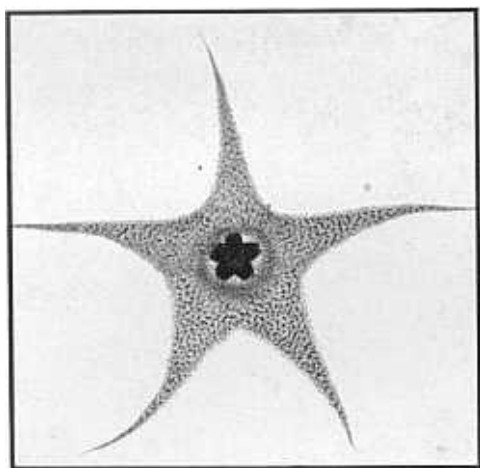


FIG. 1022

Huernia pillansii N. E. Brown x 1.5



FIG. 1023

Huernia pillansii N. E. Brown x 0.5

Plant growing in Karoo Garden, Whitehill.

Photo by R. H. Compton.

This is the aristocrat of the *Huernias*. It was discovered in 1904 by N. S. Pillans and Rudolf Marloth. The slender, graceful stems are tuberculate, with 20 to 24 often spiraled angles, 2 to 3 inches tall, the tubercles tipped with soft bristles, which make the young stems feel as soft as fur. The flowers have a campanulate tube, with

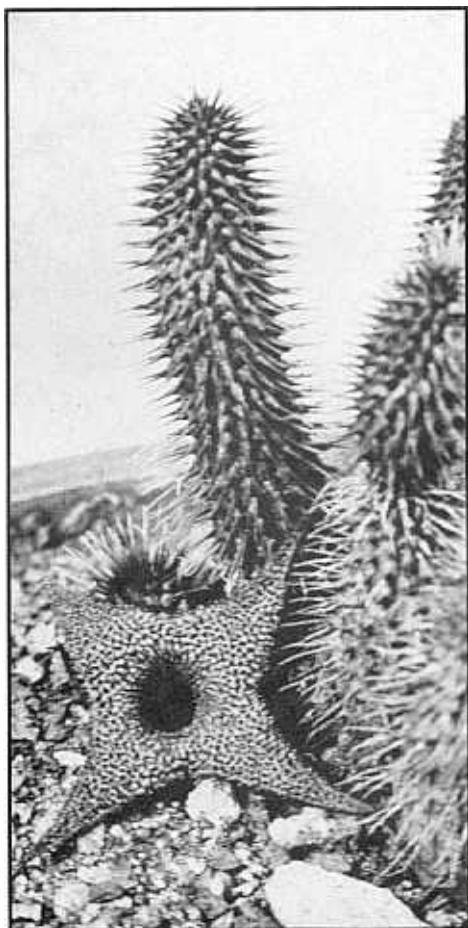


FIG. 1024

Huernia pillansii N. E. Brown x 1.5

A four-lobed flower.

flaring lobes, tapering to fine points. The inner surface is pale yellow, covered with small crimson spots and papillate throughout, the tips of the papillae also crimson. The increase in the number of angles, which remotely suggests the genus *Trichocaulon*, may indicate some special aptitude to endure extreme droughts. The plant thrives in dry, stony places near Matjesfontein, in the path of the desert winds blowing from the Karroo to the Hex River Pass; it is also found near Prince Albert, where the rainfall is occasionally very low (1926 only 2.33 inches and 1927 2.27 inches).

45. *Huernia simplex* N. E. Brown, Flora Cap., iv. i. 913. 1909.

(Description by Dr. Brown, l.c.):

Stems: erect, $1\frac{1}{2}$ to 2 in. high, sharply 4 to 5-angled, glabrous, apparently glaucous-green; teeth spreading, $\frac{3}{4}$ to 1 lin. long, compressed-deltoid;

Flowers: 3 or more together, successively produced near the base of the young stems;

Pedicel: about $\frac{1}{2}$ in. long, apparently rather slender, glabrous;

Sepals: $1\frac{1}{4}$ to $1\frac{3}{4}$ lin. long, ovate-lanceolate, acuminate, glabrous;

Corolla: (of dried flowers) about 1 in. in diameter, glabrous and smooth outside and within the tube, minutely papillate-puberulous on the inner surface of the lobes, "yellow, spotted with rosy in the centre" (*Miss Thomson*); *tube* about $\frac{1}{3}$ in. long and $\frac{1}{2}$ in. in diameter, broadly campanulate; *lobes* about $\frac{1}{3}$ in. long and as much in breadth at the base, deltoid, very acute or acuminate, apparently spreading;

Outer corona: none;

Inner corona: lobes arising at the middle of the staminal column, their basal half adnate to it as vertical semi-terete ridges between the pairs of anther-wings, and dilated into a transverse ridge or truncate rim at the top, upper half free, connivent over the anthers, $\frac{1}{2}$ to $\frac{2}{3}$ lin. long, $\frac{1}{4}$ lin. broad at the base, flat, tapering to the acute apex;

Staminal column: 1 lin. long, broadly conical at the basal half.

Type locality: Cape Prov.: Victoria West Distr.: near Gert Adriaans Kraal.

Distribution: Not further known.

The "simple *Huernia*" was discovered about 1900 by Miss Hester Thomson in the mountain area north of the Great Karroo. The plant is not in cultivation, but it is important because of the fact that the flowers have no outer corona, which, as Dr. Brown said, "distinguishes it from all other species

of *Huernia*. This character, taken alone, would place it in the genus *Huerniopsis*, but the inner corona and habit are so unlike that of the latter genus and so exactly as in *Huernia*, that I regard it as a member of that genus with the outer corona undeveloped."

STAPELIANTHUS Choux, The Stapelieae, Ed., 71 1933.

STAPELIOPSIS Choux, Compt. Rend. Acad. Sc. Paris, 44 1927. Lec Pillans, 1928.

The genus *Stapelianthus* was erected by Prof. Pierre Choux to provide for a curious plant, *S. madagascariensis*, discovered in Madagascar in 1931. A second species, also from Madagascar, has been discovered more recently. The generic name first proposed was *Stapeliopsis*, but upon learning that this name was anticipated by *Stapeliopsis* Pillans (see p. 720), Prof. Choux substituted the present name. No precise definition of the genus has been published,

it being only stated that it combined the floral structure of *Caralluma* with the habit and stem form of *Stapelia*. In some respects it would appear that both stem and flowers were most nearly suggestive of *Huernia*. The stems for example are wholly *leafless*, as in *Huernia*. The 6 (rarely 7 to 9)-angled stems of the two known species are somewhat similar to those of the 5-angled *Huernia bystrix*, which is among their nearest continental relatives, being found due

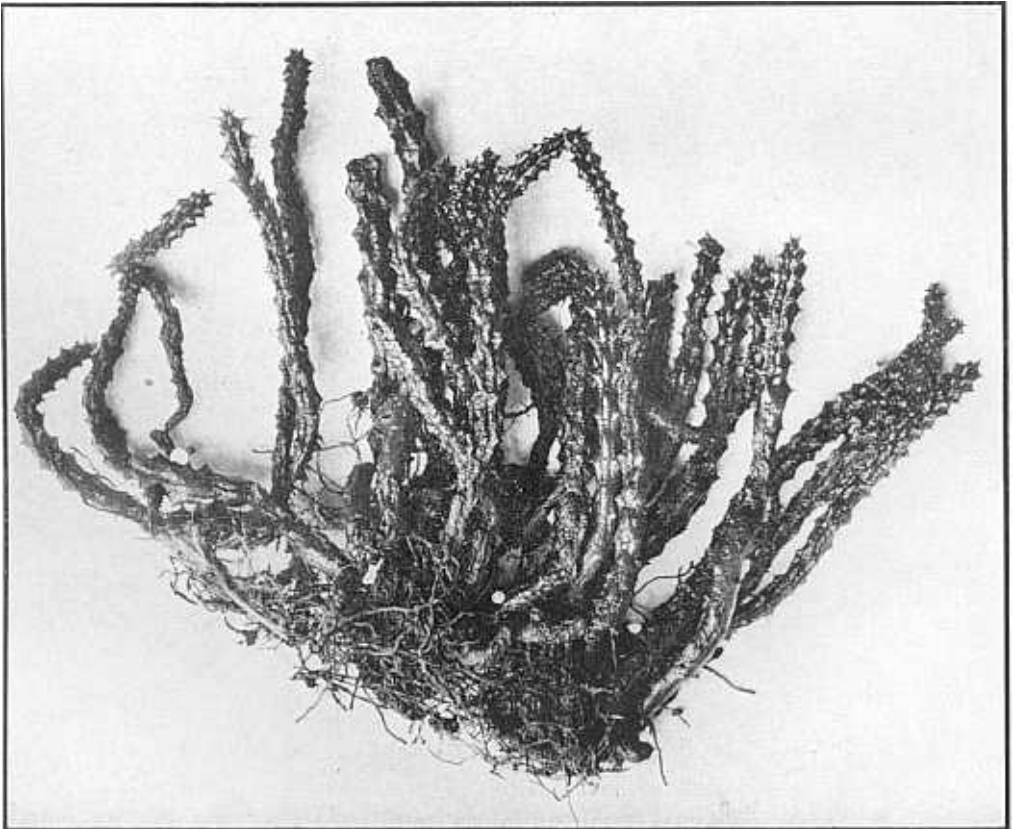


FIG. 1025

Stapelianthus decaryi Choux

Photo by P. Choux in Ann. Mus. Colon. de Marseille

west from the Fort-Dauphin Province of Madagascar, some 600 miles across the Mozambique channel, the resemblance covering both the appearance of the individual stems and their manner of growth in large crowded tufts. The flowers of *Stapelianthus* are wholly distinct from those of this particular *Huernia hystrix*, except in the interesting detail that the papillae are tipped with a red cell, and it would be far-fetched to try and discover a possible hybrid origin for the new genus. But the *Stapelianthus* flowers have a general family likeness to the genus *Huernia*, because they are produced in small fascicles at the very base of the stems, because they have tubular to campanulate shapes, with the inner corolla surface papillate and highly specialized in the direction of insect control, and most especially because they have the sinuses between the corolla-lobes projected in small intermediate points. These points do not have the prominence they attain in most of the *Huernias*. The principal distinction between *Stapelianthus* and *Huernia* lies in the form and disposition of the outer corona. In *Huernia* the outer corona is spread against the bottom of the corolla-tube, forming a flat united disk with equally flat usually bifid lobes, spread out like a miniature 10-pointed star of varying specific patterns. In *Stapelianthus* the outer corona rises from the staminal column in an erect-diverging crown, the separate lobes free to the base and deeply cleft above into comparatively slender segments, and adnate at the base to the inner corona-lobes. While the difference may at first seem a small one upon which to base a new genus, where the

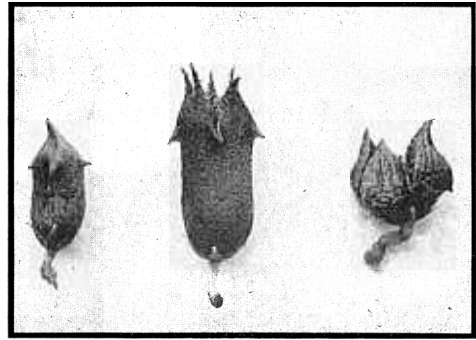


FIG. 1026

Stapelianthus decaryi (two flowers at left) and *S. madagascariensis* (right) x 1.

Photo by P. Choux in Ann. Mus. Colon. de Marseille 1934.

other characters are so reminiscent of *Huernia*, yet it is clearly of sufficient import to require the maintenance of the separate genus or else to require a new definition of *Huernia* so radical as to do away with the unity which the genus at present enjoys. The only argument which could be advanced for the union of *Stapelianthus* with *Huernia* is that, since one *Huernia* (*H. simplex*) has not any outer corona at all, therefore any plant otherwise agreeing with *Huernia* cannot be differentiated by a difference when the outer corona is present. This argument does not seem conclusive and we have maintained the genus *Stapelianthus*, all the more so as the flowers of both species so far known, while conforming to the definition of the *Huernias* in the respects indicated, still have a decided individuality which easily stamps them apart, for they have won from the strange botanical lineage of the island of Madagascar a certain character quite their own.

KEY TO THE GENUS STAPELIANTHUS

- | | |
|--|---------------------------------|
| I. Flowers with tubular corolla | 1. <i>S. decaryi</i> |
| II. Flowers with campanulate corolla | 2. <i>S. madagascariensis</i> . |

1. *Stapelianthus decaryi* Choux, Ann. Mus. Colon. Marseille, No. 3. 7. 1934.

(Description based on that by Prof. P. Choux, l.c., 13. Translated from the Latin and accompanying French text) :

Stems: densely tufted, erect, 10 cm. high, fleshy, leafless, 6 (rarely 7 to 8)-angled; angles with alternating teeth, 3 teeth in each whorl of the stem; teeth tipped with spines up to 4 mm. long;

Flowers: few, from the base of the stems;

*Pedice*l: 6 to 8.5 mm. long;

Sepals: ovate-triangular, long subulate, 5 to 7 mm. long, $1\frac{1}{2}$ to 2 mm. broad;

Corona: tubular, 21 to 24 mm. long, mottled dark purple and almost uniformly dark purple at the base of the tube within; covered on inner surface except at the base of the tube with erect fleshy cylindric papillae up to 1 mm. long, tipped with triangular hairs up to 0.35 mm. long; *tube* 13.5 to 15.5 mm. long, 8.5 mm. in diameter; *lobes* triangular acute, 7.5 to 8.5 mm. long, 6 to 7 mm. broad at the base, with a minute projecting point at the sinuses;

Outer corona: 5.5 to 6.3 mm. high, with the lobes truncate in the lower portion, then deeply bifid, exceeding the staminal column in height;

Inner corona: lobes 1.2 mm. high, triangular, adnate to the outer corona at the base, appressed at the tips against the backs of the anthers;

Follicles: long and narrow.

Type locality: Madagascar: Anosy: gneiss rocks on the east bank of the Ranofotsy Lagoon.

Distribution: Not further recorded.

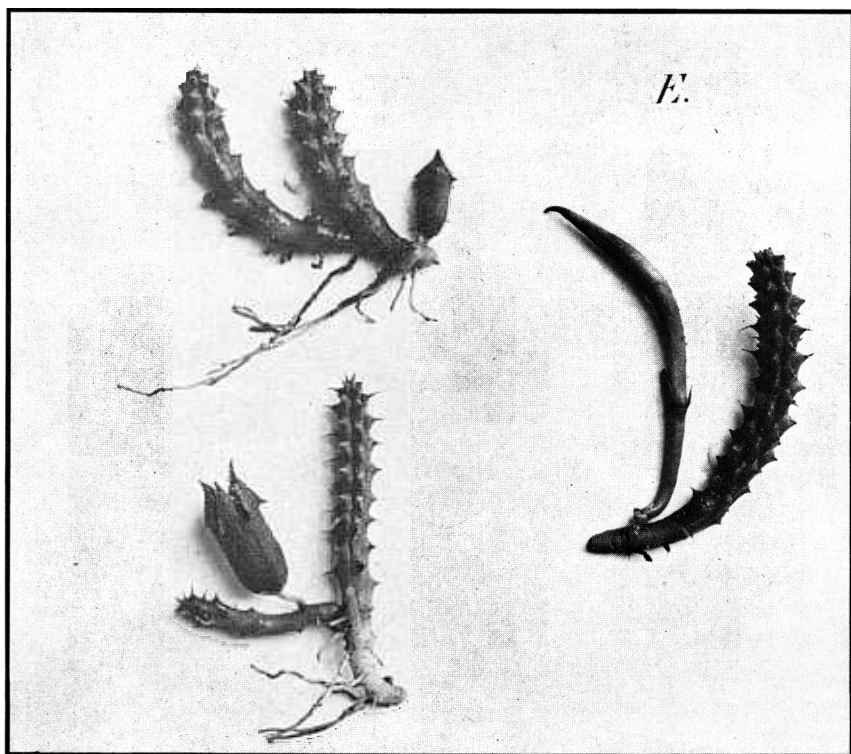


FIG. 1027

Stapelianthus decaryi Choux x 0.7

Photo by P. Choux in Ann. Mus. Colon. de Marseille, 193.

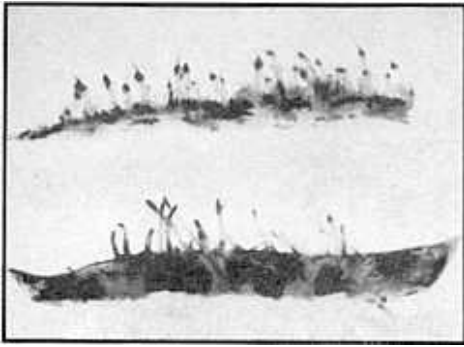


FIG. 1028

Cross-section of corolla-lobes of *Stapelianthus decaryi* (above) and *S. madagascariensis* (below)

Photo by P. Choux in Ann. Mus. Colon. de Marseille, 1934.

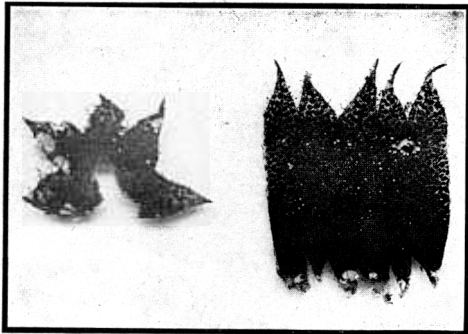


FIG. 1029

Corollas of *Stapelianthus madagascariensis* (left) and *S. decaryi* (right)

Photo by P. Choux in Ann. Mus. Colon. de Marseille, 1934.

"Decary's Stapelia-flower" was discovered in July, 1932, by Raymond Decary for whom it is named. It greatly resembles *Stapelianthus madagascariensis* in general appearance, forming dense tufts of several hundred stems. However, even in the stems there is some difference, the teeth along the angles being set somewhat closer and the spiny tips being appreciably longer. Occasionally freak stems are found with 7 or 8 angles, and sometimes the angles are spiral instead of in the usual straight formation.

And the flowers are very distinct, being conspicuously tubular in shape, instead of campanulate, as they are in *S. madagascariensis*. The corolla-lobes also are proportionately much shorter, the corolla being lobed only to a third of the way down, whereas in *S. madagascariensis* the corolla is lobed to fully half way down, producing the very different aspect shown in Fig. 1026. The papillae are shorter than those of *S. madagascariensis*, but they are tipped with unicellular hairs, which are absent in *S. madagascariensis*. In both species the tip of the papillae is colored red.

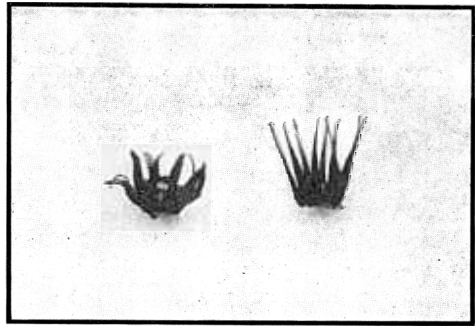


FIG. 1030

Coronas of *Stapelianthus madagascariensis* (left) and *S. decaryi* (right)

Photo by P. Choux in Ann. Mus. Colon. de Marseille, 1934.

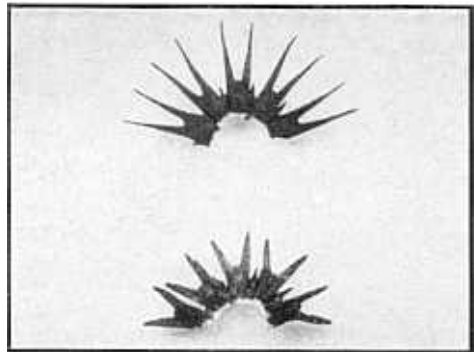


FIG. 1031

Coronas (flattened out) of *Stapelianthus decaryi* (above) and *S. madagascariensis* (below)

Photo by P. Choux in Ann. Mus. Colon. de Marseille, 1934.

2. *Stapelianthus madagascariensis* (Choux) Choux, White & Sloane: Stap., 71. 1933.

Stapeliopsis madagascariensis Choux, Compt. Rend. Acad. Sc. Paris, 1444. 1931.

(Description based on that by Prof. P. Choux, Ann. Mus. Colon. Marseille, No. 2. 9. 1932.

Translated from the French):

Stems: densely tufted, erect, 10 cm. high, 6 to 8 mm. thick, leafless, 6-angled; angles with alternating teeth, 3 teeth in each whorl of the stem;

Flowers: in small fascicles from the base of the stems;

Sepals: ovate-triangular, acute, glabrous, 4.7 mm. long;

Corolla: broadly campanulate, 13 to 15 mm. long, slightly fleshy, mottled dark purple, with thick cylindric papillae 1 to 1.4 mm. long on the inner surface; *tube* 6 to 7 mm. long, campanulate; *lobes* 6 to 9 mm. long, 6 to 7 mm. broad at the base, triangular acute;

Outer corona: 3½ mm. in diameter, lobes free, broadening slightly from the base upwards, deeply (1.7 to 2 mm.) bifid above, exceeding the staminal column in height;

Inner corona: 1 mm. high, lobes triangular, adnate at the base to the corners of the outer corona-lobes on either side, and appressed at the tip against the backs of the anthers.

Type locality: Madagascar: Province of Fort-Dauphin: 15 kilometers north of Ambovombé.

Distribution: Not further known.

The "Madagascar Stapelia-flower" is a very rare plant, native to the north of Ambovombé in the south-eastern dry zone of Madagascar, where it forms dense tufts of 300 to 400 stems. It was discovered by Raymond Decary in February, 1931, and was the first Stapeliad known from Madagascar. Compared with those of *Stapelianthus decaryi*, the outer corona-lobes appear rather stubby. They are 1.4 mm. broad at the base, increasing in width away from the base until they are about 1.8 mm. broad at the level where they bifurcate. The two cleft tips are slightly diverging and triangular in form, occasionally with a very minute tooth between them. In *S. decaryi* the outer corona-lobes are much more slender, the base having parallel sides and the teeth being proportionately much longer. In both species, while the outer corona-lobes are separate to their base, yet they are interconnected by being intergrown with the inner corona-lobes, which spring up just between them on either side. In Fig. 1031, which is photographed from the outside of the corona, the tips of the short inner corona-lobes are seen in some places between the very much longer outer

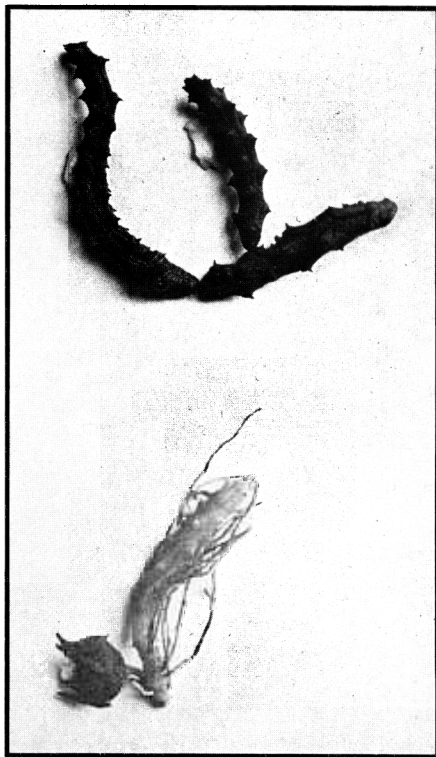


FIG. 1032

Stapelianthus madagascariensis Choux x 0.75
Photo by P. Choux in Ann. Mus. Colon. de Marseille, 1934.

corona-lobes, and the connection is formed at the base.

HUERNIOPSIS N. E. Brown, Journ. Linn. Soc., xvii. 171. 1878.

Heurniopsis K. Schumann, Engler & Prantl: Pflanzenfam., iv. ii. 277. 1895.

(Description by Dr. Brown, Flora Cap., iv. i. 922):

Plant: a dwarf herb, with stout succulent 4 to 5-angled stems;

Flowers: at the base, middle or towards the top of the stems;

Calyx: 5-partite;

Corolla: of moderate size, with a campanulate tube and 5 spreading or recurved lobes, without small teeth at the sinial angles;

Corona: of 5 simple lobes arising from the staminal column opposite the anthers and adnate to it at their basal half, free above; no outer corona;—(see text, p. 967);

Staminal column: stamens with their filaments connate into a tube around the ovary and adnate at the top to the dilated part of the style; anthers free, erect or connivent-erect around and exceeding the small truncate style-apex; *pollen-masses* solitary in each anther-cell, erect or ascending, pellucid along the inner margin, attached in pairs by very short broad cuneate caudicles to lateral processes of the pollen-carrier.

Type species: *Huerniopsis decipiens*.

Total species: 3.

Distribution: South West Africa, Bechuanaland Protectorate and Cape Province.

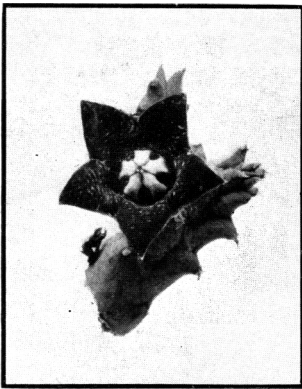


FIG. 1033

Huerniopsis decipiens N. E. Brown

Photo: G. W. Reynolds.

The genus *Huerniopsis* was established by Dr. N. E. Brown in 1878 to provide for *H. decipiens*, a tricky species to classify, as its name, the "deceitful *Huerniopsis*," implies. Dr. Brown's description applies primarily to this one species. We are extending it to include the curious plant hitherto



FIG. 1034

Huerniopsis decipiens N. E. Brown x 1.5

Huern

known as *Caralluma atrosanguinea*.

The name, *Huerniopsis*, indicates that the relationships of the genus are closest to the *Huernias*. This is true only up to a certain point. The corollas have a prominent tube, a typical *Huernia* character, but the corolla-lobes are peculiarly "excavated" at the point where they merge into the tube. This is strikingly noticeable in *Huerniopsis atrosanguinea*, of which Dr. Phillips has said: "the corolla-lobes have the appearance of being cordate at the base and slightly overhanging the tube, forming a 10-lobed ridge around the mouth." The same effect is found less prominently in *H. decipiens*, and can be distinguished in Mr. Lang's fine enlargement, Fig. 1036.

The inner corona-lobes of *Huerniopsis* are reminiscent of *Huernia* in that they are connivent-erect and much exceed the anthers, somewhat after the fashion of Schumann's section *Orthostelma* of the genus

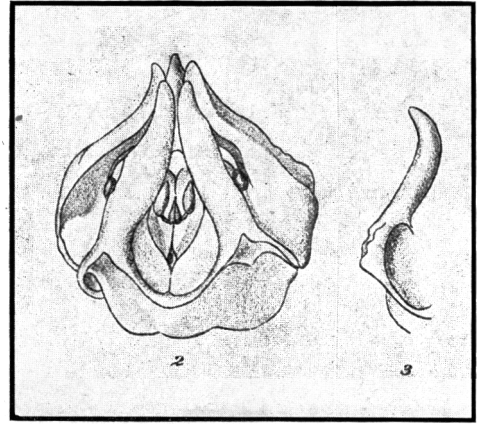
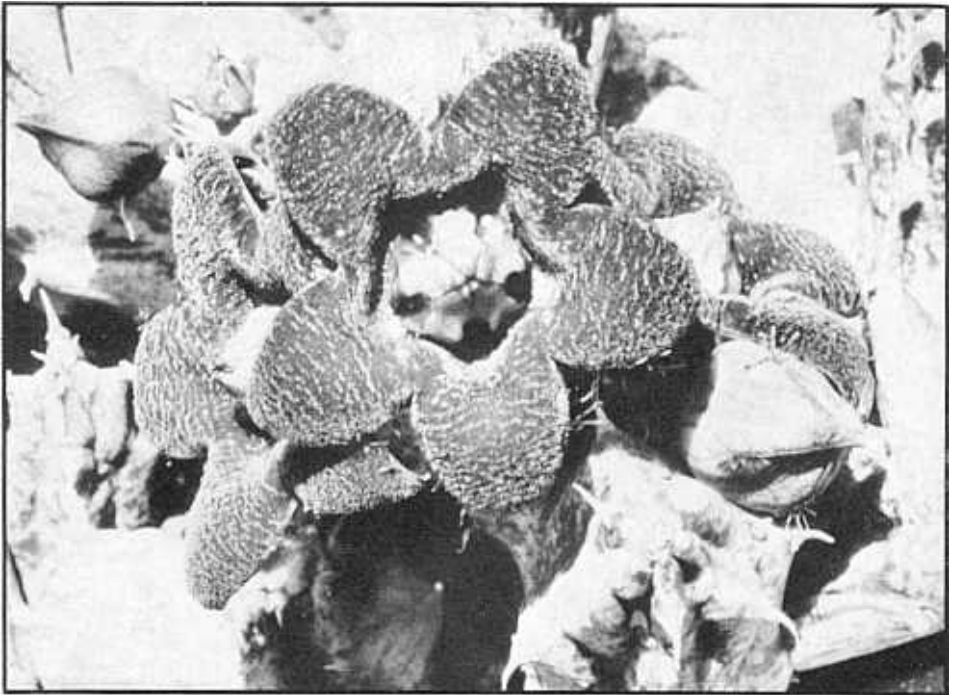


FIG. 1035

Huerniopsis decipiens N. E. Brown
enlargement of the corona, and side view
single corona-lobe. Drawing by Miss C
Flowering Plants of South

Huernia. But again the details are altogether individual, as we will explain later.

In *Huerniopsis decipiens* there is no



sis decipiens N. E. Brown x
Photo by Herbert Lang.

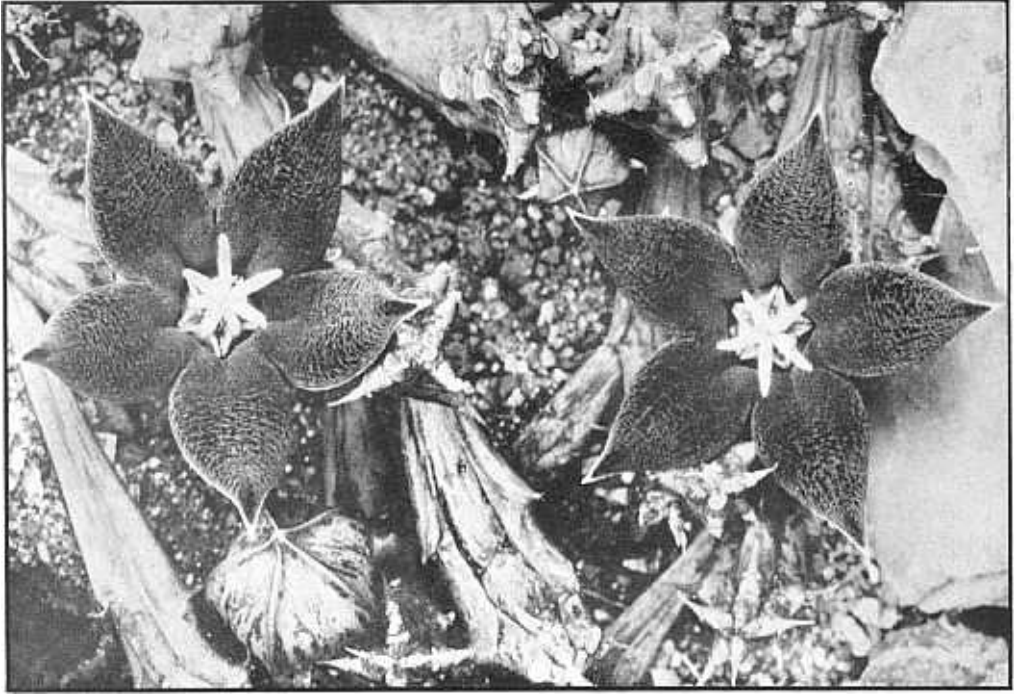


FIG. 1037

Huerniopsis atosanguinea, comb. nov.

Photo by Herbert Lang.

outer corona at all (Fig. 1035). In *H. gibbosa*, the description speaks of a bidentate lower portion of the corona-lobes, which may represent the vestige of an outer corona-lobe. In *H. atosanguinea* the outer corona-lobes are somewhat more distinct

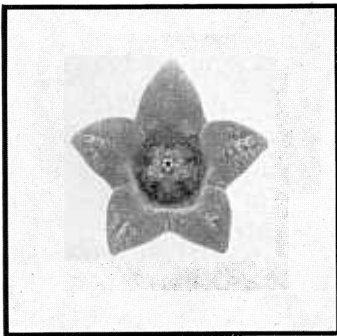


FIG. 1038

Huerniopsis decipiens N. E. Brown

Photo: G. W. Reynolds, Johannesburg, of a flower collected 12 miles south of Postmasburg, Hay district.

(Fig. 1040). While these coronal differences are so considerable that hitherto no one has considered bringing *H. atosanguinea* into the same genus with *H. decipiens*, yet they are no greater than the coronal differences between *Huernia simplex* and *Huernia hystrix*, nor more perplexing than the coronal differences between many of the *Carallumas*. Indeed the difference appears to be one of development rather than of fundamental character.

When Dr. N. E. Brown first described *H. atosanguinea*, in 1901, he considered it to be a *Stapelia*. In 1904 he transferred it to *Caralluma*, "on account of its habit, its very distinct corolla-tube and the peculiar channeled outer corona-lobes." Now the stem habit of *H. atosanguinea* is not particularly affiliated with the *Carallumas*. The rudimentary denticles at the base of the teeth, in combination with the decumbent manner of growth, rather suggest some

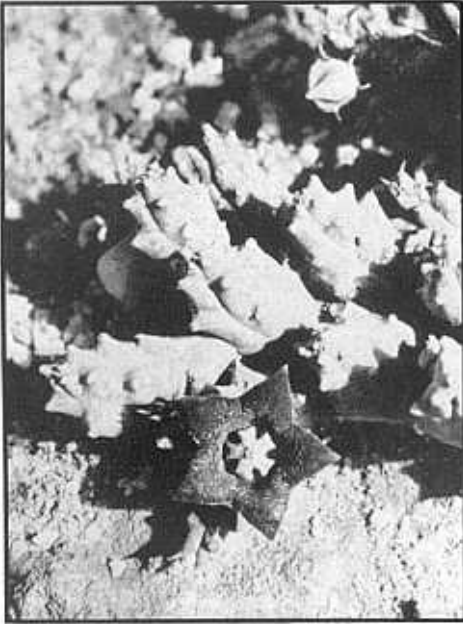


FIG. 1039

Huerniopsis decipiens N. E. Brown

Photo: G. W. Reynolds, Johannesburg, of a plant from Hopetown, C. P. "This form," says Mr. Reynolds, "has centre of flower of much lighter color than the corolla-lobes. In other flowers the lobes and centre of flower are all the same dark color, as in Fig. 1038."

kinship with *Duvalia* and *Piранthus*, and we should not forget the absence of an outer corona in the flowers of the latter. But when all is said, the stems of *Huerniopsis* most closely resemble one another. G. W. Reynolds writes us: "I have *H. decipiens* and *H. atrosanguinea* growing side by side, both in bud, and they are almost indistinguishable, not only in their stems, but in the shape, size, color and markings of the buds."

The most remarkable common property of *H. decipiens* and *H. atrosanguinea* is their dependence on large nocturnal moths for the transfer of their pollen. They secrete a rich nectar, and open their flowers in the late afternoons, about four o'clock, on hot sunny days. The flowers of *H. decipiens* remain open several days; those of *H. atrosanguinea* fade early on the following afternoon. The habitat of *H. atrosanguinea* coincides with a portion of the far wider range of *H. decipiens*; but whether this points to the action of hybridizing influences which have created the several forms, or whether it simply depends in turn upon the habitats of a particular group of moths, we do not yet know. In all probability we should take off our hats to the moths for having stimulated the evolution of the genus. For they seem to have stimulated the plants to conceal their nectar in cavities of the corona-lobes within the corolla-tube at points conveniently approached along the "excavations" at the base of the corolla-lobes, near the moth traps in the surface of the staminal column, in a manner which is by no means entirely altruistic.

To define the coronal structure more closely, we may say that in *Huerniopsis* the outer corona-lobes are either represented by basal teeth on the two sides of the inner corona-lobes, or else entirely absent; when present, *H. atrosanguinea*, they are longitudinally folded into a channel in which the nectar is secreted; when absent, *H. decipiens*, the base of the inner corona-lobes is slightly concave, serving a similar purpose.

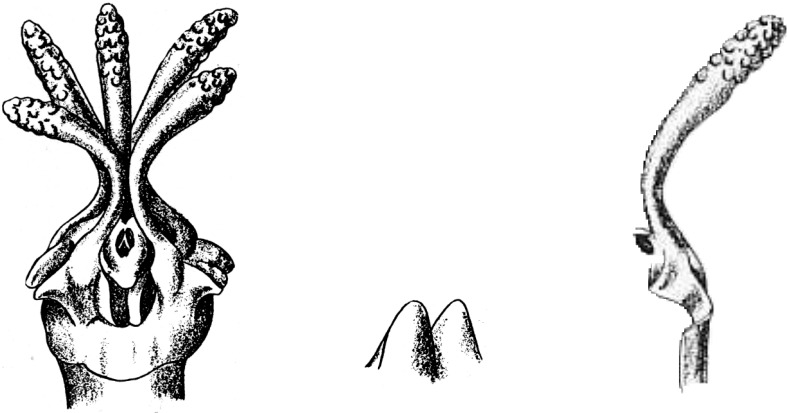


FIG. 1040

Enlargement of the corona, with an outer and an inner corona-lobe of
Huerniopsis atrosanguinea, comb. nov.
From a drawing by Miss Cythna Letty in the Flowering Plants of South Africa, 1932.



FIG. 1041

Huerniopsis papillata Nel
Photo by G. C. Nel.

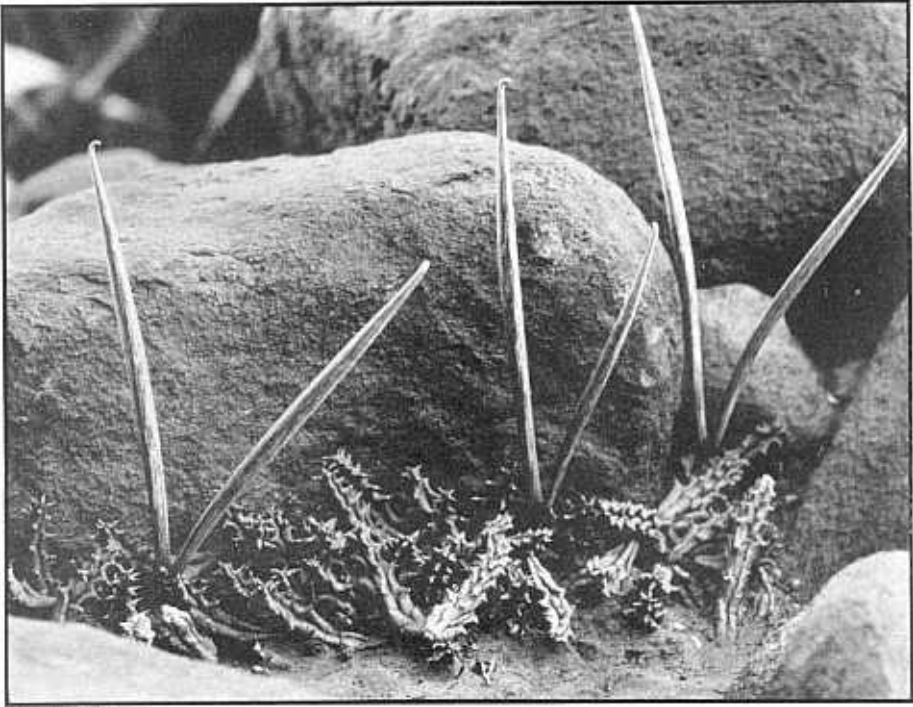


FIG. 1042

Fruiting stems of *Huerniopsis decipiens* N. E. Brown

Photo by S. Tapscott.

1. *Huerniopsis decipiens* N. E. Brown, Journ. Linn. Soc., xvii. 171. 1878.

(Description by Dr. Brown, Flora Cap., iv. i. 922):

Stems: decumbent, more or less clavate, 1 to 3 in. long, $\frac{1}{3}$ to $\frac{1}{2}$ in. thick, obtusely 4-angled, with spreading teeth 1 to $1\frac{1}{2}$ lin. long, glabrous, dull green or purplish tinted; teeth with a minute tooth on each side at the base of the ultimately marcescent tips;

Flowers: 2 to 4 together at the middle or towards the top of the young stems, opening successively;

Pedicel: 1 to 3 lin. long, stout, glabrous;

Sepals: $\frac{1}{4}$ to $\frac{1}{3}$ in. long, lanceolate, acuminate, glabrous;

Corolla: in bud glabrous, ellipsoid, acuminate, 5-angled; when expanded about 1 in. in diameter, glabrous outside and within, fringed at the base of the lobes with a few vibratile clavate dark purple hairs, outside pale greyish-green spotted and streaked with purplish-grey, inside brownish-red or rich brownish-crimson, more or less mottled with yellow, the intensity of color varying even in flowers of the same cluster; *tube* 4 to 5 lin. long and as much in diameter, campanulate; *lobes* 4 to 5 lin. long, 3 to 4 lin. broad at the base, deltoid-ovate, acuminate or very acute, recurved;

Corona: lobes about $2\frac{1}{2}$ lin. long, very stout, nearly square in transverse section at the lower adnate part, with subulate acute connivent-erect tips much exceeding the anthers, purplish on the back and at the apex, yellowish on the slightly concave sides below the middle.

Type locality: South Africa: without precise locality.

Distribution: South West Africa: near Windhoek; etc.; Bechuanaland Protectorate: near Molepolole; Cape Prov.: Bechuanaland: near Vryburg; Griqualand West: Barkly West Distr.: Warrenton; Fourteen Streams; Herbert Distr.: Douglas; Mazelsfontein; Campbell; Hay Distr.: Griquatown; Read's Drift; Paardeberg Mountains; Postmasburg; Hopetown Distr.: Hopetown; Strydenburg; Prieska Distr.



FIG. 1043

Huerniopsis decipiens N. E. Brown x 1

Photo by James West.



FIG. 1044

Huerniopsis decipiens N. E. Brown x 5

afternoon and emit their rather nauseous odor most strongly during the evening; the next morning it can scarcely be detected even close to the flower, so that the flower is probably fertilized by a late-flying insect. The corona-lobes copiously secrete a sweet fluid on their backs and sides."

Discovered by Prof. MacOwan about 1875, and since then collected at many points in the northern Cape Province, the Bechuanaland Protectorate and South West Africa, where it crosses a short distance into the Tropics. It is very common in Griqualand West, in particular, with Kimberley more or less as a centre. It usually grows in pure fine sand under low thorn bushes. The campanulate flowers are brownish-red to brownish-crimson, mottled with yellow, the size and distribution of the markings on the lobes being very variable, even between different flowers on the same plant. "The flowers," wrote Dr. N. E. Brown in the *Flora of Tropical Africa*, "remain open for about 40 hours. They usually open towards the latter part of the



FIG. 1044-A

Huerniopsis decipiens N. E. Brown x 1

2. *Huerniopsis papillata* Nel, sp. nov.

(Description by Dr. G. C. Nel):

Planta procumbens vel suberecta, glabra, 4-angulata; spini triangulati, acuti. Flores 3-4 fasciculati, apicem versus erumpentes. Sepala ovata, acuminata, glabra. Petala ovata, acuta, verruculosa, alba, rubro-purpureo-maculata, hispida (pili albi, breves, multi), sinus versus pilis clavatis purpureis ciliata; tubus campanulatus, papillatus, pilis multis brevibus munitus, purpureo-maculatus, basi viridis, glaber. Corona albo-lutea vel purpureo-maculata, erecta; segmenta subcylindrica, antheris incumbentia sed eas excedentia; apices conniventi-erecti, plano-compressi, subacuti.

Stems: 3 to 5 cm. long, 0.5 to 1.5 cm. thick, decumbent with apex sometimes suberect, glaucous-green, glabrous, 4-angled; tubercles prominent, ending in sharp triangular teeth, which bear at the base two minute denticles pointing towards the stem;

Flowers: 3 to 4, in fascicles near apex of the stems;

Pedicel: 3 mm. long, glabrous;

Sepals: 4 mm. long, 2 mm. broad, ovate, acuminate;

Corolla: in bud 7 to 8 mm. long, conical, acute; when expanded, 3.2 cm. in diameter; *tube* campanulate, greenish at the base and glabrous, purple-spotted above and provided with numerous short stiff white hairs; *lobes* 1.5 cm. long, 9 mm. broad, ovate, acute, slightly verruculose, white background with irregular reddish-purple spots on inner face, covered with numerous stiff white hairs, each hair arising from a papilla, ciliate near the sinuses with clavate purple hairs;

Corona: whitish-yellow or purple-spotted; lobes subcylindrical, incumbent on the anthers but produced slightly beyond them, connivent-erect, slightly recurved outwards at the plano-compressed acute apex.

Type locality: British Bechuanaland: Debeeti.

Distribution: Not further known.

The "papillate *Huerniopsis*" was discovered by Dr. G. C. Nel in September, 1935, in British Bechuanaland, growing in dense mats under bushes. It flowered at the University Botanical Garden, Stellenbosch,

March 20, 1936 (Type No. 7347). It is closely allied to *H. decipiens*, but differs from it in having the inner corolla surface papillate, the papillae tipped with short stiff white hairs. (See Fig. 1041).

3. *Huerniopsis atosanguinea* (N. E. Brown), comb. nov.

Stapelia atosanguinea N. E. Brown, Gard. Chron., xxx. 425. 1901.

Caralluma atosanguinea N. E. Brown, Flora Trop. Afr., iv. i. 485. 1904.

(Description by Dr. Brown, Flora Trop. Afr., l.c.):

Stems: 2 to 3 in. long, 5 to 6 lin. thick, 4-angled, cespitose, branching and decumbent at the base, greyish-green marbled with brownish-purple, glabrous; angles obtuse, toothed; teeth $1\frac{1}{2}$ to 3 lin. long, stout, conical, tipped with a subulate acute quickly withering leaf-rudiment, having 2 minute teeth at its base;

Flowers: in fascicles of 2 to 3 at about the middle of the younger stems, developing successively;

Bracts: $1\frac{1}{2}$ to 2 lin. long, subulate;

*Pedice*l: $2\frac{1}{2}$ to 3 lin. long, stout, glabrous;

Sepals: $4\frac{1}{2}$ lin. long, 1 lin. broad, lanceolate, acuminate, spreading;

Corolla: about $1\frac{3}{4}$ in. in diameter, outside quite glabrous, greyish-green mottled with purplish; inside rich deep blackish-crimson, without spots or markings; *tube* $3\frac{1}{2}$ lin. long, about 7 lin. in diameter outside, campanulate; *lobes* $\frac{2}{3}$ to $\frac{3}{4}$ in. long, $\frac{1}{2}$ in. broad, ovate, very acute, tipped with a short mucro, very spreading, slightly recurved along the margins, excavated at the mouth of the tube opposite the lobes of the outer corona, very slightly rugulose and very minutely papillate on the inner face;

Outer corona: lobes arising $\frac{1}{2}$ lin. above the base of the staminal column, horizontally spreading firm, rather fleshy, about 1 lin. long and broad, deltoid-ovate, longitudinally folded, forming a channel in which nectar is secreted, bifid at the obtuse apex, dull orange-yellow, reddish in the channel;

Inner corona: lobes 5 lin. long, linear-terete, obtuse, much exceeding and incumbent on the anthers at the base, then divergent, ochreous at the base passing into pale sienna above, whitish at the tips.

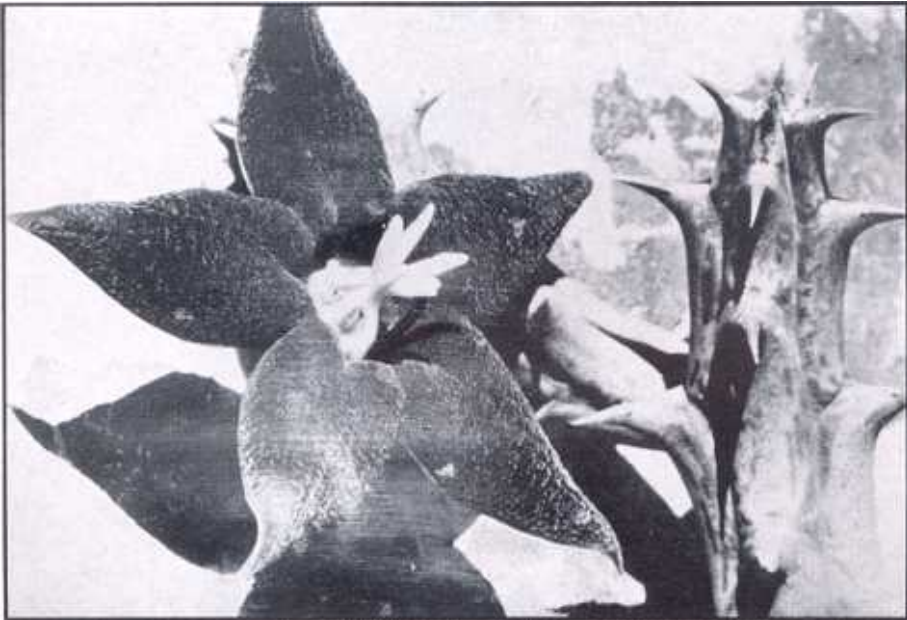


FIG. 1045

Huerniopsis atosanguinea, comb. nov. x 2.2

Photo by Herbert Lang, from the South Africa Pictorial Calendar, 1936

Type locality: Bechuanaland Protectorate: northern Kalahari Desert, 3000 feet elevation.
 Distribution: Also in Bechuanaland Prot.: Molepolole; 9 miles north of Gaberones;
 Transvaal: Pretoria Distr.: Pienaars River; Garstfontein Farm; Zoutpansberg Distr.:
 on road from Waterpoort to Zoutpan.

The "dark blood-red *Huerniopsis*" was discovered by Major Lugard in the northern Kalahari in 1896-97. The flowers are minutely papillate on the inner face, rich blackish-crimson, the corolla-lobes tipped

with stiff points. We have discussed on p. 967 our reasons for transferring this interesting plant from the genus *Caralluma* to *Huerniopsis*.



FIG. 1046

Huerniopsis atosanguinea, comb. n.
 from the original water color drawing by Miss Cythna
 Plants of South Africa, 1932.

th

ECHIDNOPSIS Hooker fil., Bot. Mag., t. 5930. 1871.

Virchowia Vatke, ex K. Schumann, Monatsschr. Kakt., 101. 1893.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 474):

Plants: leafless, succulent, with stout cylindric several-angled branching *stems*; angles tessellately divided by impressed transverse lines into very obtuse and minutely apiculate tubercles, the apiculus being a rudimentary leaf;

Flowers: small, in fascicles (sometimes solitary by abortion) along the grooves between the angles and mostly towards the apex of the stems;

Calyx: 5-partite;

Corolla: rotate or rotate-campanulate, 5-lobed, fleshy;

Corona: arising from the staminal column;

Outer corona: none, or cupular, or of 5 short lobes or pouches alternating with the anthers;

Inner corona: of 5 fleshy lobes horizontally inflexed and incumbent on the backs of the anthers;

Staminal column: arising from the base of the corolla, very short; *anthers* horizontally incumbent on the top of the subtruncate style; *pollen-masses* horizontal, solitary in each anther-cell, united in pairs to the minute pollen-carriers.

Type species: *Echidnopsis cereiformis*.

Total species: 8 or more.

Distribution: Southern Arabia, Socotra and Tropical and South Africa.

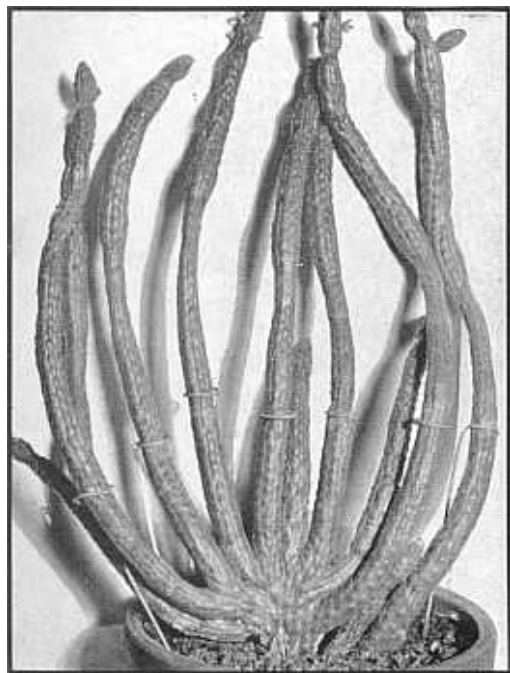


FIG. 1047

Echidnopsis cereiformis Hooker fil.
Stems branching from a crested base.

The genus was established in 1871 by Sir J. D. Hooker to provide a niche for a curious recently discovered species, which he christened *Echidnopsis cereiformis*. The name *Echidnopsis* means "viper-like" in Greek and must not be confused with *Echinopsis*, meaning "hedgehog-like," which is a familiar genus of cacti. Both names are very descriptive, and the long cylindric glabrous stems of *Echidnopsis*, with their 6 to 10 spineless, tubercled angles, take on sinuous curves that are often realistically snake-like. *Echidnopsis* is the most northerly of the many-angled Stapeliad genera. Until 15 years ago it was believed to be restricted in distribution to Southern Arabia and tropical east and north-east Africa, with an unidentified species on the island of Socotra. In 1922, however, Prof. Dinter discovered a plant in South West Africa, south of the tropics and more than 2000 miles distant from the habitat of any of the tropical species, which (although he never saw it in flower) he diagnosed as an *Echidnopsis* and called *E. atlantica*. The

legend that there existed an *Echidnopsis* of the Atlantic Seaboard has now become a reality through the recent discovery by P. Ross-Frames of *E. framesii* near Van Rhynsdorp, in the westerly part of the Cape Province, some 250 miles south of the habitat of the hypothetical *E. atlantica*. Botanically, *Echidnopsis* is little else than a subdivision of *Caralluma*. Dr. Brown once said that "it cannot be technically distinguished from *Caralluma* by its floral structure, but as all the species are well characterized by their peculiar many-angled tessellate stems it is perhaps more convenient to keep them generically distinct." The range of the genus is nearly 4000 miles, yet in spite of the distances which separate

some of the species the appearance of their stems is hardly distinguishable, except that the number of angles varies slightly in certain cases.

The small flowers differ widely, however, and in their coronas seem to parallel different moments in the development of the *Carallumas*. In this respect *Echidnopsis scutellata* may be compared to *Caralluma armata*; while *E. nubica*, with no outer corona at all, is closely akin to *C. quadrangula*. From the importance of the corona throughout the genus, the Key is based primarily on the outer corona structure of the several species, which are then differentiated by the color of the flowers, their size and the number of the stem-angles.

KEY TO THE GENUS ECHIDNOPSIS

- I. Outer corona absent:
 - A. Corolla under 1/4-inch, yellowish marked with purple-brown; stems 6 to 10-angled 1. *E. nubica* (1/8 to 1/6 in.)
 - B. Corolla over 1/4-inch:
 - 1. Corolla yellow; stems 8-angled 2. *E. cereiformis* (1/3 in.)
 - 2. Corolla brown; stems 6 to 10-angled 2 (a-b) *E. cereiformis* varieties.
- II. Outer corona of 5 separate pointed lobes:
 - A. Apex of outer corona-lobes ascending-incurved; stems 6 to 8-angled 3. *E. somalensis* (1/3 in.)
 - B. Apex of outer corona-lobes deflexed-spreading; stems 8 to 10-angled 4. *E. dammanniana* (1/3 in.)
- III. Outer corona cup-shaped:
 - A. Corolla yellow; stems 8-angled 5. *E. scutellata* (1/3 to 1/2 in.)
 - B. Corolla with purple tones:
 - 1. Stems 7 to 8-angled 6. *E. bentii* (1/2 in.)
 - 2. Stems 6-angled:
 - a. Edge of outer corona obtusely crenate 7. *E. virchowii* (1/4 in.)
 - b. Edge of outer corona toothed 8. *E. framesii* (1/3 in.)

1. *Echidnopsis nubica* N. E. Brown, Kew Bull., 263. 1895.

Echidnopsis dammanniana Schweinfurth, Gartenflora, 633. 1895. *Nec* Sprenger, 1892.

(Description by Dr. Brown, Flora Trop. Afr., iv. i. 475):

Stems: and inflorescence as in *E. cereiformis*; (Stems generally 8-angled, but occasionally 6 to 10-angled, W. & S.);

Sepals: $\frac{1}{2}$ to $\frac{3}{4}$ lin. long, lanceolate, acute, minutely papillate on the back;

Corolla: rotate or rotate-campanulate, $1\frac{1}{2}$ to 2 lin. in diameter, 5-lobed to rather more than half-way down; *lobes* $\frac{1}{2}$ to $\frac{3}{4}$ lin. long, ovate, acute, glabrous, smooth within, minutely papillate on the outside;

Outer corona: none;

Inner corona: lobes deltoid-ovate, about $\frac{1}{4}$ lin. long, incumbent on the backs of the anthers and about equaling them in length;

Follicles: attaining a length of 4 in. and a thickness of 4 lin., purplish with darker markings.

Type locality: Sudan: Kassala Prov.: Mount Erkowit, near Suakin.

Distribution: Sudan: Kassala Prov.: foothills south-west of Suakin; Eritrea: Geleb and other sections; Southern Arabia: highlands of Yemen.

The tiny flowers of the "Nubian *Echidnopsis*" are pale purple on the outer face and greenish-yellow inside, spotted and marbled with purplish-brown. They share with the flowers of *Caralluma sinaica* the distinction of being the smallest possessed by any Stapeliad. Their average size is only $\frac{1}{8}$ inch, and it would take 150 of them laid side by side to span the corolla of a single flower of *Stapelia gigantea*. The

species is named for the Nubian Desert, where Schweinfurth discovered it, 1868.

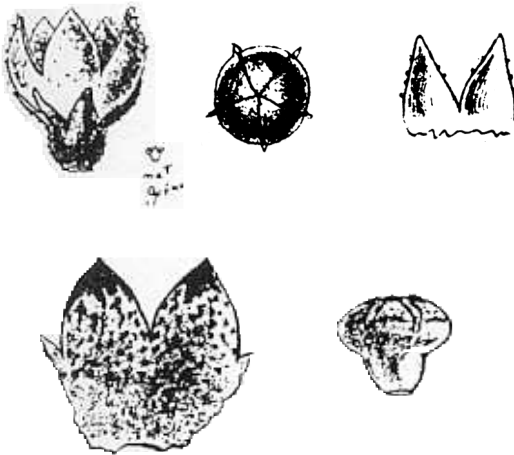


FIG. 1048

Echidnopsis nubica N. E. Brown

Drawing by G. A. Schweinfurth, showing the corolla, a bud, two sepals, two corolla-lobes and the corona. From Gartenflora, 1895.

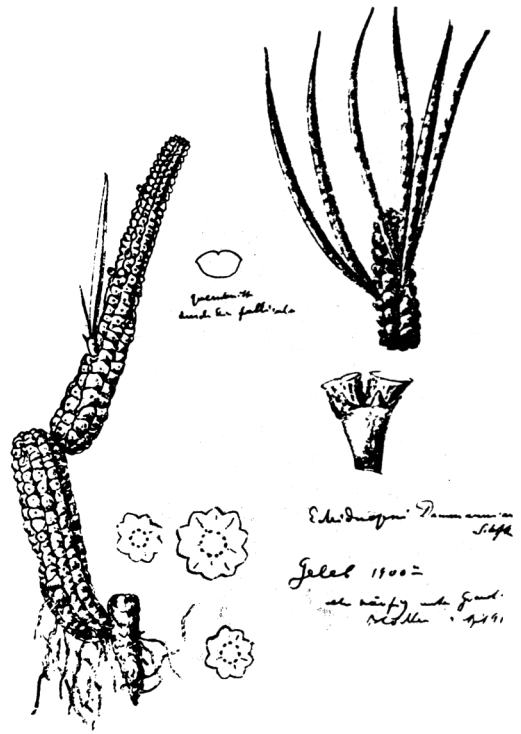


FIG. 1049

Echidnopsis nubica N. E. Brown

Drawing of fruiting stem by G. A. Schweinfurth, from Gartenflora, 1895. The name on the drawing, *E. dammanniana*, is incorrect.

2. *Echidnopsis cereiformis* Hooker fil., Bot. Mag., t. 5930. 1871.*Stapelia cylindrica* Hort., Bot. Mag., t. 5930. 1871.*Apieranthes tessellata* Decaisne, Ann. Sc. Nat., 5 Ser., xiii. 406: 1871.*Piarranthus fascicularis* Hort., Monatsschr. Kakt., 101. 1893.*Echidnopsis tessellata* K. Schumann, Engler & Prantl: Pflanzenfam., iv. ii. 274. 1895.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 475):

Stems: fleshy, leafless, $\frac{1}{2}$ to $\frac{5}{8}$ in. thick, cylindric, obtusely 8-angled; angles tessellately divided into obtuse tubercles, glabrous;*Flowers*: fascicled near the tips of the stems, subsessile, bright yellow;*Sepals*: $\frac{1}{2}$ to $\frac{3}{4}$ lin. long, broadly ovate, acute, glabrous;*Corolla*: $3\frac{1}{2}$ to 4 lin. in diameter, rotate-campanulate, 5-lobed to half-way down; lobes $1\frac{1}{2}$ lin. long, broadly ovate, acute, glabrous;*Outer corona*: none;*Inner corona*: of 5 smooth fleshy deltoid-ovate acute lobes, horizontally inflexed and incumbent on the backs of the anthers, yellow.

Type locality: Unknown.

Distribution: Eritrea: near Geleb; Ethiopia: near Dschedscha; among rocks, district of Maschila; Somaliland: dry chalky soil near Passo di Cavernan; ?Southern Arabia: Yemen: Uossil, altitude 4200 feet; Bilad Fodhli.*Echidnopsis cereiformis* is the well-known *Echidnopsis* found in virtually every collection of Stapeliads. Whether, as its name implies, the stems have the form of a *Cereus* is as idle a question as whether *Trichocaulon cactiforme* is at all like acactus! Like the other *Echidnopsis* devoid of an outer corona, *E. nubica*, its habitat is believed to include both sides of the Red Sea. In Africa it has been collected in Eritrea, Somaliland and Ethiopia. Its first discoverer is not known, but it has been in cultivation since before 1871, when it was described by Sir Joseph Dalton Hooker. It is a ready grower and a free bloomer, and when covered with many clusters of small gay yellow flowers the tessellate stems make a pretty show. It is also an interesting plant for its occasional readiness to develop freak crest-like growths. It is one of the hardiest Stapeliads and will grow out of doors almost everywhere that *Stapelia variegata* will do so.*E. cereiformis* is a variable species. Two dark-flowered varieties have been described, besides which other forms, not conforming exactly to the type of the varieties, are occasionally met with, sometimes approaching rather closely to the nearly-related *E. nubica*. The principal character of *E. nubica* lies in its mottled and spotted corolla-lobes, and in one plant of *E. cereiformis* we have seen flowers whose corolla-

FIG. 1050

Echidnopsis cereiformis Hooker fil. x 1

lobes exhibit shaded areas of yellow merging into the darker tones of purplish-brown. Another curious example of the dark-flowered *E. cereiformis* has the corolla-lobes blackish-purple, with the lower two-

thirds of the lobes puberulous. The corolla-lobes are tipped with a purplish-brown and there is a band of the same color across the knuckle where they bend in over the anthers.

Var. a. *Echidnopsis cereiformis* var. *brunnea* (Dammann) Berger, *Malpighia*, 160. 1902.

Echidnopsis dammanniana var. *brunnea* Dammann, Cat. Dammann & Co., 46. 1893.

As in the type, but flowers yellowish-brown to purple-brown, paler towards the centre. This variety is believed to have

been found near Asmara, in Eritrea, and perhaps also in Ethiopia.

Var. b. *Echidnopsis cereiformis* var. *obscura* Berger, *Malpighia*, 160. 1902.

?*Apteranthes cylindrica* Decaisne, Ann. Sc. Nat., 5 Ser., xiii. 406. 1871.

?*Echidnopsis cylindrica* K. Schumann, Engler & Prantl: *Pflanzenfam.*, iv. ii. 274. 1895.

As in the type, but the flowers yellowish-brown. Attributed to Eritrea. It is uncertain whether *Echidnopsis cylindrica* is identical with this variety or whether it should be

regarded as a third independent variety. Decaisne states that it differs from *E. cereiformis* (the type) in its longer branches and larger flowers.

3. *Echidnopsis somalensis* N. E. Brown, *Flora Trop. Afr.*, iv. i. 477. 1904.

(Description by Dr. Brown, l.c.):

Stems: cylindric, 4 to 8 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. thick, tessellately 6 to 8-angled, dull green, glabrous;*Flowers*: solitary or 2 to 3 together, subsessile;*Sepals*: $\frac{1}{2}$ lin. long, ovate, acute, very minutely papillate;*Corolla*: rotate-campanulate, about $3\frac{1}{2}$ lin. in diameter, dull purple-brown, variegated with yellow on the lobes, yellow spotted with purple-brown on the disk; *lobes* spreading, $1\frac{1}{2}$ to $1\frac{3}{4}$ lin. long, $1\frac{1}{4}$ lin. broad, ovate, acute, minutely tuberculate on the back, covered with minute conical acute or almost bristle-like papillae on the inner face;*Outer corona*: lobes overtopping the inner corona, $\frac{1}{3}$ lin. long, very narrow, linear, obtuse, ascending-incurved, channeled down the inner face, dark purple-brown, glabrous;*Inner corona*: lobes about $\frac{1}{3}$ lin. long, deltoid-oblong, very obtuse or emarginate, incumbent on the backs of the anthers and not exceeding them in length, greenish.

Type locality: British Somaliland: without locality.

Distribution: Not further known.

The name of this species refers to its original habitat in Somaliland, whence it was sent about 1896 by Mrs. E. Lort-Phillips to the Botanic Gardens in Cambridge, England. It has since disappeared again from cultivation. The flowers are characterized by the very singular outer coronalobes, which are quite slender and rise up in wavy curves between the lobes of the inner corona.

There is an apparent paradox in the figuring of *E. somalensis* in the Botanical Magazine in 1903, the year before its original publication in the Flora of Tropical Africa, 1904. The explanation is that, while Fig. 1051 appeared in the Magazine in December, 1903, and this volume of the Flora is dated 1904, yet the actual printing occupied more than two years, from July, 1902, to November, 1904, and the pages containing the descriptions of all the STAPELIEAE had been printed as early as March, 1903.

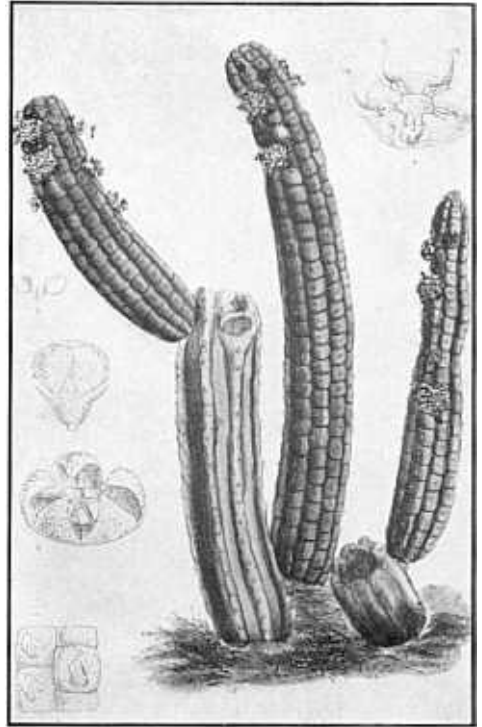


FIG. 1051

Echidnopsis somalensis N. E. BrownFrom a drawing by Miss Matilda Smith, in *Curt Botanical Magazine*, 1903.

4. *Echidnopsis dammanniana* Sprenger, Cat. Dammann & Co., 4. 1892.

?*Boucerosia cylindrica* Brongniart, Bull. Soc. Bot. Fr., vii. 900. 1860.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 475):

Stems: like those of *E. cereiformis*, $\frac{5}{8}$ to $\frac{3}{4}$ in. thick, tessellately 8 to 10-angled, dull greyish- or purplish-green, glabrous;

Flowers: solitary or 2 to 5 together, subsessile, but the pedicel lengthening to 1 lin. long in fruit;

Sepals: $\frac{3}{4}$ lin. long, ovate-acuminate, glabrous, very minutely papillate;

Corolla: rotate, $3\frac{1}{2}$ lin. in diameter, dark purple-brown on the lobes, yellowish with dark purple-brown dots on the disk; *lobes* $1\frac{1}{4}$ lin. long, 1 lin. broad, ovate, acute, glabrous, papillate outside;

Outer corona: lobes small, spreading or deflexed, concave, tooth-like or with the sides more or less pinched together at about the middle, dark purple-brown, glabrous;

Inner corona: lobes $\frac{1}{2}$ lin. long, deltoid, acute, incumbent on the backs of the anthers, dark purple-brown, glabrous.

Type locality: Eritrea: Geleb.

Distribution: Eritrea: perhaps also from Halai; and near Selet.

The discovery of *E. dammanniana* is attributed to Prof. Penzig, during his visit to Eritrea in 1891. Its name commemorates the plant nursery of Dammann and Co., at San Giovanni a Teduccio, Naples. This firm was active during the early 90's in distributing the discoveries of the botanical explorers around the Red Sea, which C. Sprenger, a member of the firm, helped to introduce. The name, *E. dammanniana*, is now-a-days often incorrectly applied to the dark-brown-flowered varieties of *E. cereiformis*, which the species very closely resembles, but it can readily be distinguished because its flowers always have the distinct purple-brown outer corona, with spreading pointed lobes, whereas all the forms of *E. cereiformis* have no outer corona at all.

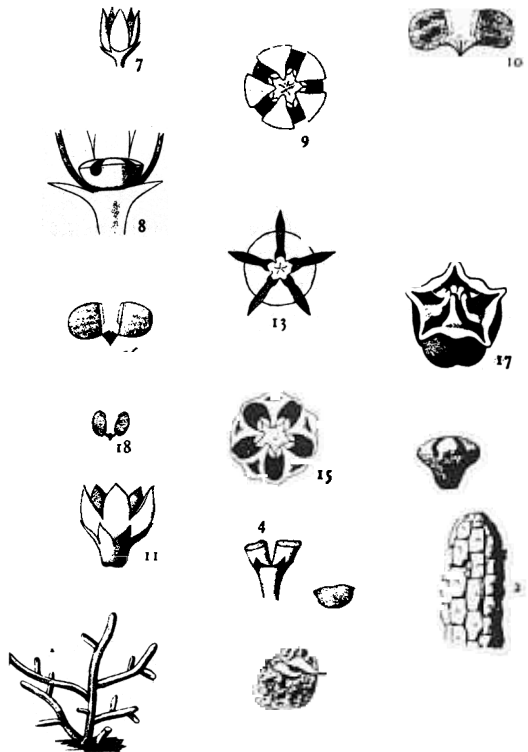


FIG. 1052

From *Malpighia*, 1892

- 1-10. *Echidnopsis cereiformis* Hooker fil.
 11-12. *E. nubica* N. E. Brown (Corolla and corona).
 13-14. *E. dammanniana* Sprenger (Corona).
 15-16. *E. virchowii* K. Schumann (Corona and pollen)
 17-18. *E. bentii* N. E. Brown (Corona and pollen).

5. *Echidnopsis scutellata* (Deflers) Berger, Stap. und Klein., 26. 1910.*Caralluma scutellata* Deflers, Bull. Soc. Bot. Fr., 21. 1896.

(Description based on that by A. Deflers, l.c., translated from the Latin):

Plant: a succulent green branching herb; *stems* 10 to 30 cm. long, 1 cm. thick, erect or procumbent and altogether similar to those of *E. cereiformis*, 8-angled, the angles formed of hexagonal tubercles, with tiny scale-like leaves at the centre of the tubercles;

Flowers: 1 to 2 near the tips of the stems;

*Pedice*l: 1 mm. long;

Sepals: reddish-green, linear-acute, shorter than the corolla-tube;

Corolla: lobed to barely half-way down, minutely velvety-papillate, outside greenish, inside yellowish, dotted red at the base of the tube; *tube* campanulate, 3 to 3½ mm.; *limb* rotate; *lobes* 3 mm. long, deltoid, slightly replicate at the margins, pale reddish-green at their tips on outer face;

Outer corona: cup-shaped, with the edge formed of 5 irregularly toothed and revolute segments;

Inner corona: lobes incumbent over the anthers and produced slightly beyond them;

Follicles: 7 to 8 cm. long, 2½ mm. in diameter, glabrous.

Type locality: Southern Arabia: Bilad Soubaihi: Wadi Mo'aden, 900 feet elevation.

Distribution: Not further known.

Deflers, who discovered this "shield-shaped *Echidnopsis*" in May, 1894, found the outer corona structure so closely parallel to that of the flowers of *Caralluma armata* that he classified the species as a *Caralluma*. The stem form, however, determines its inclusion in *Echidnopsis*. The plant has not been collected again and is known only from the type specimen, which is preserved in the herbarium of Prof. Schweinfurth.

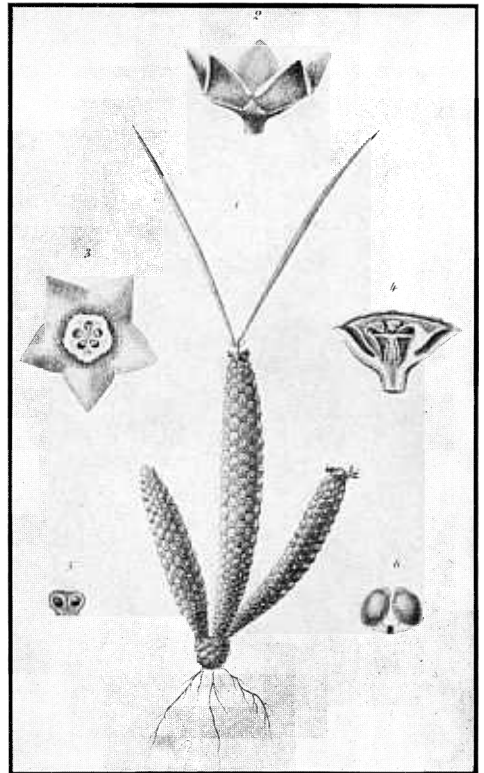


FIG. 1053

Echidnopsis scutellata Berger (3) x 2.

From a drawing in Bull. Soc. Bot. Fr., 1896.

6. *Echidnopsis bentii* N. E. Brown, Bot. Mag., t. 7760. 1901.

(Description by Dr. Brown, l.c.):

Plant: at present 5 to 6 in. high, consisting of a short stem, with branches ascending of a pale brown color; *stem* and branches $\frac{1}{2}$ to $\frac{3}{4}$ in. in diameter, the latter narrowing upwards, 7 to 8-angled, each angle consisting of a single series of tubercles, each of which is crowned by a minute ovate concave cuspidate leaf, about $\frac{1}{20}$ in. long;

Flowers: in pairs towards the tips of the branches, very shortly pediceled, $\frac{1}{2}$ in. in diameter;

Sepals: ovate-lanceolate, acute;

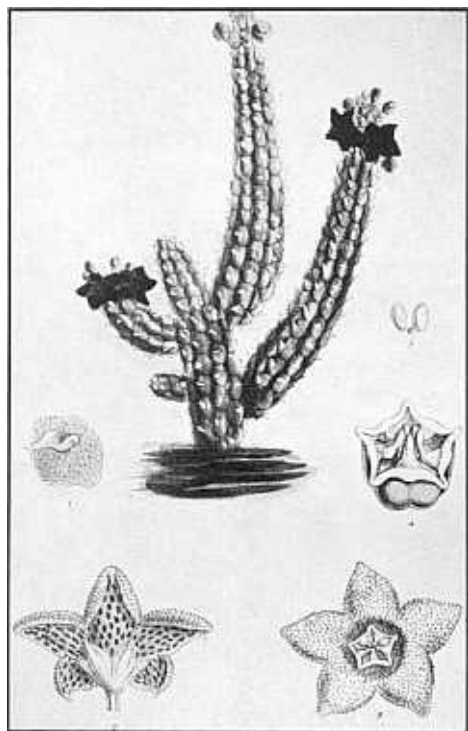
Corolla: with a short campanulate tube and spreading lobes, externally green, spotted with purple, internally velvety, of a rich, deep vinous-purple; *lobes* ovate, apiculate, margins revolute;

Outer corona: cupular, acutely 5-angled, truncate, purple;

Inner corona: of 5 erect and conniving, shortly clavate lobes, which are adnate at the base to the base of the outer corona.

Type locality: Southern Arabia: without locality.

Distribution: Unknown, probably Hadramaut district, east of Aden.



This species was sent to the Royal Botanic Gardens, Kew, as Sir J. D. Hooker wrote in Curtis's Botanical Magazine, "by the intrepid traveler whose name it bears, shortly before his death, together with fragments of other plants collected by him during his last expedition. It flowered in a warm house of the Royal Gardens in June, 1899." "Bent's *Echidnopsis*" has flowers nearly $\frac{1}{2}$ in. in diameter, equaling in size those of any other species in the genus. They are broadly bell-shaped, conspicuously spotted in purple outside and deep vinous-purple and thickly velvety within. It is unfortunate that this interesting plant is no longer in cultivation.

FIG. 1054

Echidnopsis bentii N. E. Brown

3. Flower $\times 3$.

From a drawing by Miss Matilda Smith, in Curtis's Botanical Magazine, 1901.

7. *Echidnopsis virchowii* K. Schumann, Monatsschr. Kakt., 98. 1893.*Virchowia africana* Vatke, Monatsschr. Kakt., 101. 1893.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 476):

Stems: $3\frac{1}{2}$ to 5 lin. thick, 6-angled, tessellately divided into slightly pronounced tubercles; habit and general appearance as in *E. cereiformis*, but more slender;

Flowers: subsessile, flat-topped in bud;

Sepals: about $\frac{1}{2}$ lin. long, ovate, acute, minutely papillate;

Corolla: about $3\frac{1}{2}$ lin. in diameter, rotate, 5-lobed to half-way down; outside minutely tuberculate, dingy green or dull purplish; inside very minutely papillate, either entirely dull greenish or yellowish-green, dotted with purple-brown or with the apical part of the lobes entirely dull purple-brown; *lobes* about 1 lin. long and broad, ovate, acute;

Outer corona: distinct, cupular, rising to the level of the inner, obscurely 5-angled, with 5 small minutely apiculate pouches alternating with the angles, which are opposite the inner corona-lobes, dark purple-brown, with the inside of the pouches yellowish, spotted with purple-brown;

Inner corona: lobes deltoid, acute, obtuse or minutely and irregularly toothed or bifid at the apex, horizontally incumbent on the backs of the anthers and not produced beyond them, dark purple-brown indistinctly mottled with dull yellowish.

Type locality: Tanganyika: near Tanga.

Distribution: Not further known.

Discovered by J. M. Hildebrandt about 1880 near Tanga in Tanganyika, which is about 75 miles north of the island of Zanzibar and approximately the same distance south of Mombasa. The name, "Virchow's *Echidnopsis*," was given by Schumann in honor of the German pathologist, Rudolf Virchow (1821-1902). According to Berger the plant was not uncommon in

cultivation as late as 1910, but it is uncertain whether any of the cultivated specimens still survive.

E. virchowii is characterized by the little pouches which make up the cup-shaped outer corona. These may be seen in the combination figure reproduced in the notes to *E. dammanniana*.

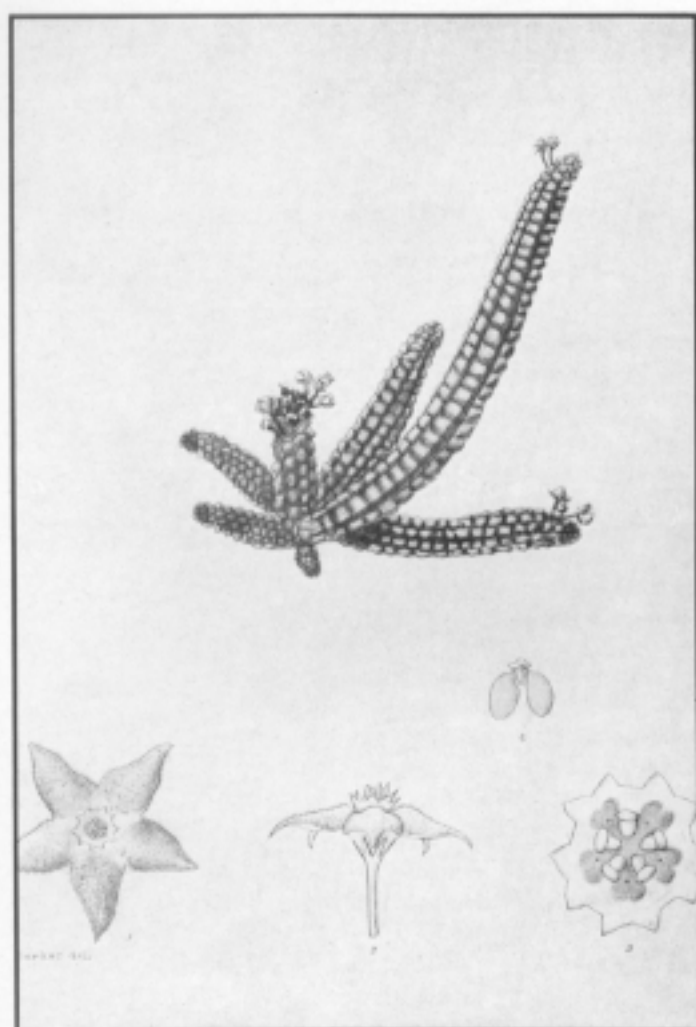


FIG. 1055

Echidnopsis framesii, nom. nov.

From a water color drawing by Miss W. F. Barker in the Flowering Plants of South Africa, 1933.

8. *Echidnopsis framesii*, nom. nov.

Caralluma tessellata Pillans, Kew Bull., 187. 1933.

(Description by N. S. Pillans, l.c., translated from the Latin, in Flow. Pl. So. Afr., 1933):

Stems: erect from a decumbent base, occasionally procumbent, up to 10 cm. long, 1 to 1.3 cm. thick, usually somewhat curved, sparingly branched at base, sub-cylindric, longitudinally furrowed, very obtusely 6-angled, the angles divided by transverse furrows into tetragonal or hexagonal slightly prominent areoles, each with a papilla-like rudimentary leaf, glabrous, bright green, indistinctly marked with grey specks;

Flowers: in fascicles of 2 to 5, in the longitudinal furrows near the apex of the stems, developing successively or several simultaneously;

Pedicel: ascending, 4 to 5 mm. long, glabrous;

Sepals: 2 mm. long, ovate-lanceolate, acute, glabrous;

Corolla: 8 to 9 mm. in diameter, glabrous on the lower surface; *lobes* 3 to 4 mm. long, slightly reflexed, recurved at the tips, ovate, acute, the upper surface convex, purple, covered, except at the tips and margins, with papillae, each tipped with a short simple hair; *disk* about 1 mm. wide, convex, covered with short papilla-like hairs, pale green, mottled with purple; *tube* about 1 mm. deep, 2 mm. wide at the mouth, smooth within, with a few papilla-like hairs at the mouth;

Outer corona: about 1 mm. high, 2 mm. wide, cupular, egg-yellow, lobes erect-spreading, transversely oblong, separated by rounded sinuses, deeply emarginate, the teeth obtuse or rarely acute;

Inner corona: lobes about 1 mm. long, linear-oblong, obtuse, egg-yellow, incumbent on the backs of the anthers, slightly recurved at the tips.

Type locality: Cape Prov.: Van Rhynsdorp
Distr.: near the main road between
Nieuwerust and the Zout River.

Distribution: Not further known.

This remarkable plant has substantiated Prof. Dinter's belief in the presence of the genus *Echidnopsis* in South Africa. It was discovered in October, 1929, by P. Ross-Frames in the Van Rhynsdorp district, west of the Bokkeveld Mountains and just outside of the peculiar geological formation of the Knersvlakte. The papillate-hairy flowers are about a third of an inch in diameter, the corolla-lobes purple, with a circle of pale green, mottled with purple, on the disk. "The corolla and corona," according to Mr. Pillans, "are those of a typical *Caralluma*, and in general habit our plant resembles *C. maughani*, which was found in the same locality. The corona of the two species are, however, very different." Because of the flower form, the species was referred to the genus *Caralluma*, the specific name indicating that its stems "exactly resemble the stems of species of *Echidnopsis* found in North Africa." But the two genera, *Caralluma* and *Echidnopsis*, are separated only upon the character of the stems, and no complete distinction can be drawn between the flowers of the two, so that as wide a range of flower forms may, in theory at least, be expected in the smaller genus as exists in the larger one. We have therefore felt we should transfer the present species to *Echidnopsis* and we regret that, in so doing, it has not been

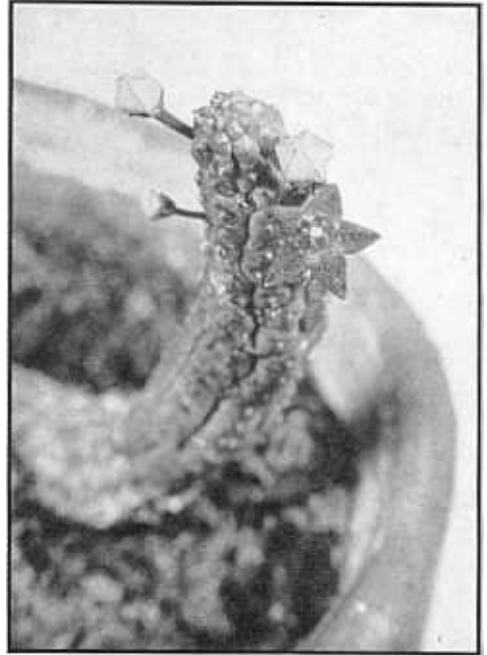


FIG. 1056

Echidnopsis framesii, nom. nov. x

possible to retain the specific name given to it by Mr. Pillans. The combination, *E. tessellata*, proposed by us in the first edition of this book, had been previously introduced by K. Schumann (in Engler and Prantl: Pflanzenfam., iv. ii. 274. 1895). The circumstance that Schumann's use of the name was not valid, since it proved to be only a synonym for *E. cereiformis*, is unimportant, for a name once assigned to any given plant, even where later shown to be invalid, may not be used again to designate another species. We have therefore rechristened the species in honor of its discoverer, *E. framesii*.

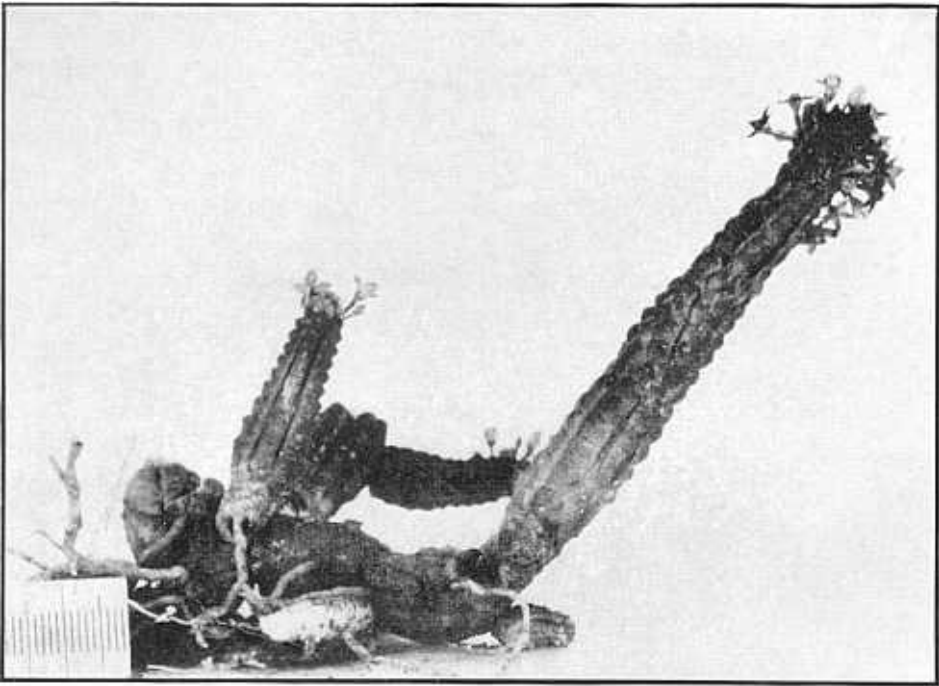


FIG. 1057

Echidnopsis serpentina, comb. nov

Photo by H. Herre

***Echidnopsis serpentina* (Nel), comb. nov.**

Caralluma serpentina Nel, Kakteen-Jahrb., 23. 1936.

(Description by Dr. G. C. Nel, l.c., translated from the Latin and German):

Stems: trailing and branching, 3 to 10 cm. long, 1 to 1.2 cm. thick, glabrous, green with a tinge of purple, sub-cylindrical, tapering towards the apex, with 8 prominent angles separated by slight furrows; angles divided into 5 or 6-sided tubercles, tipped with a whitish point;

Flowers: in fascicles of 8 or 9 towards the apex of the stems;

Pedicel: 3 to 4 mm. long, terete, reddish;

Sepals: 1 mm. long, deltoid-lanceolate, acute, reddish-white;

Corolla: outside whitish, granulate; inside covered with very short stiff rose-purple bristles, rose-purple with a narrow whitish-yellow circle at the centre around the corona; lobes ovate-acuminate, terminating in an acute white tip;

Outer corona: of 10 uniform short spreading lobes, sulphur yellow;

Inner corona: lobes linear, obtuse, incumbent on the anthers and recurved at the tips; sulphur-yellow.

Type locality: Cape Prov.: Van Rhynsdorp Distr.: near Van Rhynsdorp.

Distribution: Also in the outlying country, for instance near the Knersvlakte.

The "serpentine *Echidnopsis*" was collected by H. Herre near Van Rhynsdorp in June, 1931. It is well-named, growing under brush with its snake-like tessellate stems peeping out into the open. The de-

scription reached us while this book was in the printer's hands and there has been no opportunity to compare it carefully with the description of *E. framesii*. The shape and color of the flowers is very similar,

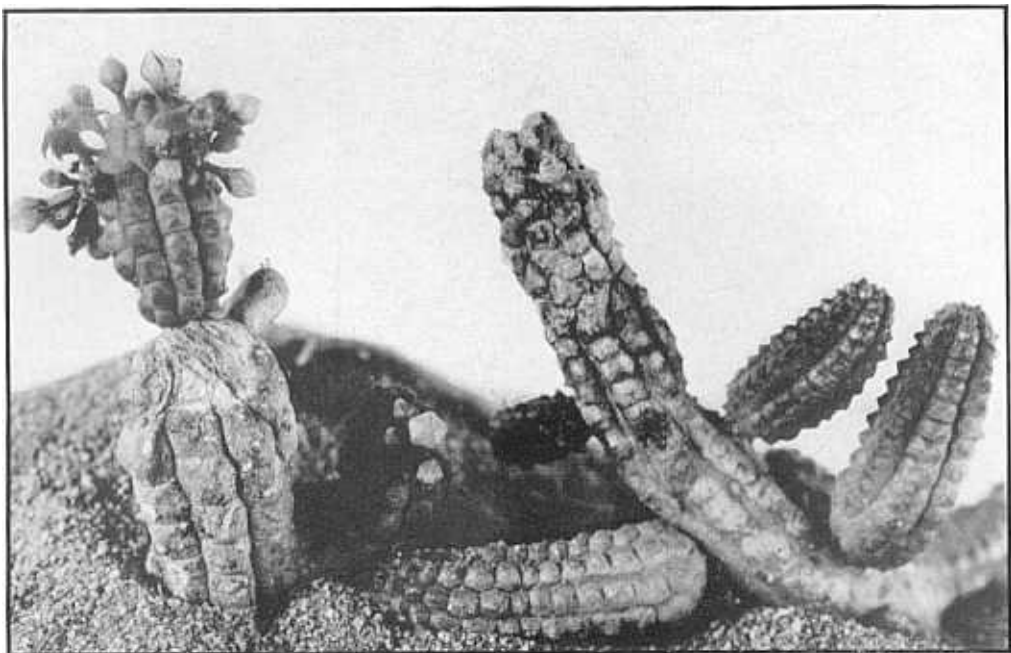


FIG. 1058

Echidnopsis serpentina, comb. nov.
Photo by H. Herre in Kakteen Jahrbuch, 1936.

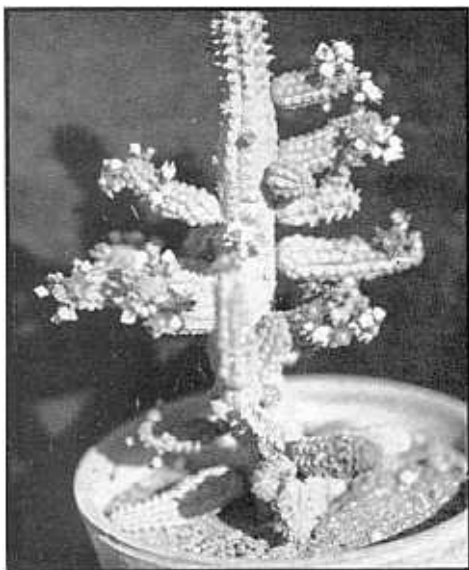


FIG. 1058-A
Echidnopsis serpentina, comb. nov.
Photo by W. Triebner.

to such details as the form of the inner corona-lobes. However, the pale circle disk is not mottled with purple, as it *framesii*. The size of the floral parts stated. The principal differences to lie in the stems, which are 8-

angled, instead of 6-angled, and in the form of the outer corona-lobes. The habitat of both plants is in the Van Rhynsdorp district, a circumstance pointing towards a possible varietal relationship.

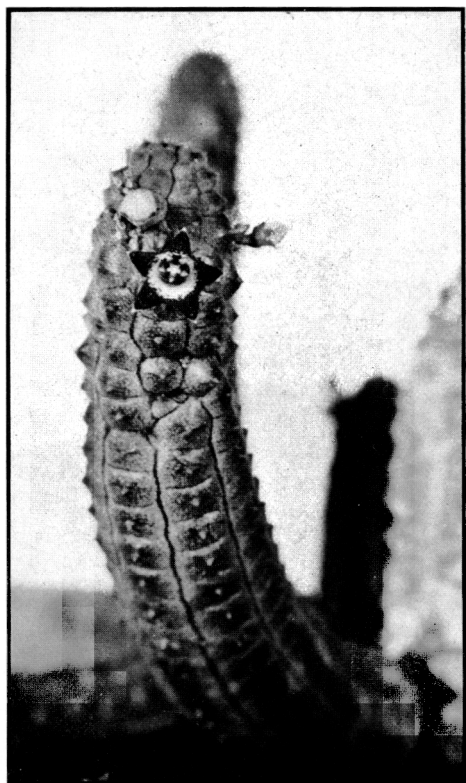


FIG. 1059

Echidnopsis serpentina, comb. nov. x 1.5

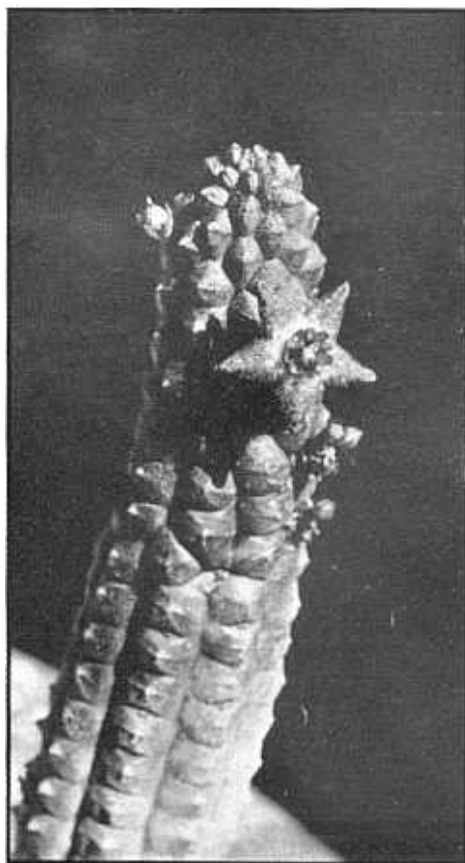


FIG. 1060

Echidnopsis serpentina, comb. nov. x 2.

Photo by Carl Luckhoff.

Echidnopsis atlantica Dinter, Fedde: Repertorium, xxx. 191 1932.

Prof. Dinter's account of his discovery in South West Africa of this imperfectly known species is so interesting that the following extract from it may well be quoted at length: "Nearly in the centre of the Klinghardt Range, on the north side of the main valley, there is a row of 4 phonolith hills running from west to east. At the foot of the most easterly of the four, on the north side, I discovered on Sept. 23, 1922, in quartz sand among rocks as large as one's head, the erect seedling of a Stapeliad, as long as my finger. From the division of the stem into broad tubercles I saw at once that it was something wholly extraordinary. It could not be a *Tavaresia* or a *Hoodia*, because of the absence of spines. There remained only the possibility of its being an *Echidnopsis*. Could this be the case, when none of the known species extend their habitat below the 5th degree of south latitude, whereas I was so far to the west, only 40 kilometers east of the Atlantic coastline and below 27 degrees 20 minutes south latitude? Yes, there could be no doubt that I had discovered the most southerly *Echidnopsis* of them all. While the vanishing daylight still promised success I at once began an eager hunt with my two Hereros for further specimens, if possible for one in flower or seed. But in spite of my promises of a big reward our search was all in vain, and though we continued the hunt during the next five days over several square kilometers among the hills and found many beautiful things, yet we could discover no further trace of our *Echidnopsis*. There are still several hun-

dred kilometers of similar territory to explore in the Klinghardt Range, so that someone will one day, perhaps 100 years hence, be again as fortunate as I was on Sept. 23, 1922.

"This plant lived two years in my garden at Farm Lichtenstein, but eventually died. Here is its description: *Stem* 40 cm. long, not fully grown, 34 mm. thick, at first erect, then decumbent in an arch and again erect at the tip, 10-angled. The angles formed of tubercles, 8 to 10 mm. wide, 7 to 8 mm. long, faintly marbled over and bearing a brownish, soft, pointed apiculus. Tiny sets for flower development were appearing in fascicles between the tubercles of the same angle (not in the furrows between the angles)."

One may indeed hope that this "Atlantic *Echidnopsis*" will soon be rediscovered and its flowers be known. The difference in number of stem angles, 10 instead of 6, makes it unlikely that it is closely related to the still more southerly *Echidnopsis framesii*. The reference to a trace of inflorescence along the stem angles is unique. K. Schumann once wrote (*Monatsschr. Kakt.*, 98, 1893) that *Echidnopsis* is distinguished from all other Stapeliad genera by the flowers arising from the furrows between the angles; but Dr. Brown pointed out (*Flora Trop. Afr.*, iv. i. 474. 1904) that they flower in this way, the pedicels usually forming a little to one side of the middle of the channel, in every genus except in a few species of *Caralluma* in which the umbels are terminal or the flowers subaxillary.

TRICHOCAULON N. E. Brown, Journ. Linn. Soc., xvii. 164. 1878.

(Description by Dr. Brown, Flora Cap., iv. i. 888):

Plants: succulent perennials, with thick cylindric leafless *stems*, having many vertical series of conical tubercles, tipped with a spine or a stout stiff bristle, or with crowded irregularly or spirally arranged short rounded pointless tubercles;

Flowers: rather small, arising between the tubercles at or towards the top or all over the stems, subsolitary or 2 or more together, successively developed;

Calyx: 5-partite;

Corolla: with a short tube or the united part flattish or saucer-shaped, rarely with a raised ring on the disk, 5-lobed; lobes valvate in bud;

Corona: double, or sometimes the outer and inner corona apparently belonging to one series of 5 shortly 3-toothed segments opposite the anthers;

Outer corona: of 5 bipartite or bifid (or trifid, *W.* & *S.*) or emarginate lobes, with straight or divergent-arcuate segments;

Inner corona: lobes incumbent upon the backs of the anthers and sometimes produced beyond them, dorsally connected at the base with the outer corona and sometimes produced into a short tooth there;

Staminal column: arising from the bottom of the corolla, short; *anthers* inflexed upon the dilated part of the style, linear-oblong, without appendages; *pollen-masses* ascending or subhorizontal, solitary in each anther-cell, pellucid along the inner margin, attached in pairs to the pollen-carriers by very short caudicles; *style* not exceeding the anthers, truncate at the apex;

Follicles: fusiform, smooth; *seeds* crowned with a tuft of hairs.

Type species: *Trichocaulon piliferum*.

Total species: 26 or more.

Distribution: Cape Province, South West Africa and Madagascar.

Trichocaulon is a genus of about 25 species, from Tropical and South Africa, differing from *Caralluma* only in the many-angled, tuberculate habit of the stems. The flowers are small, $1/6$ to $3/4$ inches, with the corona distinctive yet evidently related to some *Carallumas*, such as *C. dependens*. The stems are framed of many rows of conical tubercles, tipped with spine, stiff bristle or hair; or of 8 or more stoutly toothed tuberculate angles; or of an irregular arrangement of spineless tubercles. The first and last group, the spiny-stemmed and the spineless-stemmed, would, according to Dr. Marloth, "be better kept as separate genera." We do not feel a generic division to be necessary, for the flowers are indistinguishable and even an absolute classification of the stems may not be possible; for the spiny-stemmed *Trichocaulon pedicel-*

latum possesses many characters of the spineless group and the "spineless" *T. simile*, according to Dr. Marloth, has the youngest apical tubercles "tipped with a small apiculus or bristle." However, a division into Sections is very natural, and we have adopted three: *Eutrichocaulon*, the spiny-stemmed group; *Cactoidea*, the spineless-stemmed; and *Tricholuma*, reserved for the tooth-angled species, *T. columnare*.

Eutrichocaulon includes the "genuine *Trichocaulons*," to which alone the name *Trichocaulon*, which means "hairy stem" in the Greek, is at all appropriate. In this section the stems are usually divided into more or less regular rows of tubercles, tipped with spine or bristle, and their general appearance is cylindrical, rather than globose. The flowers are generally distributed all over the upper half of the stems.

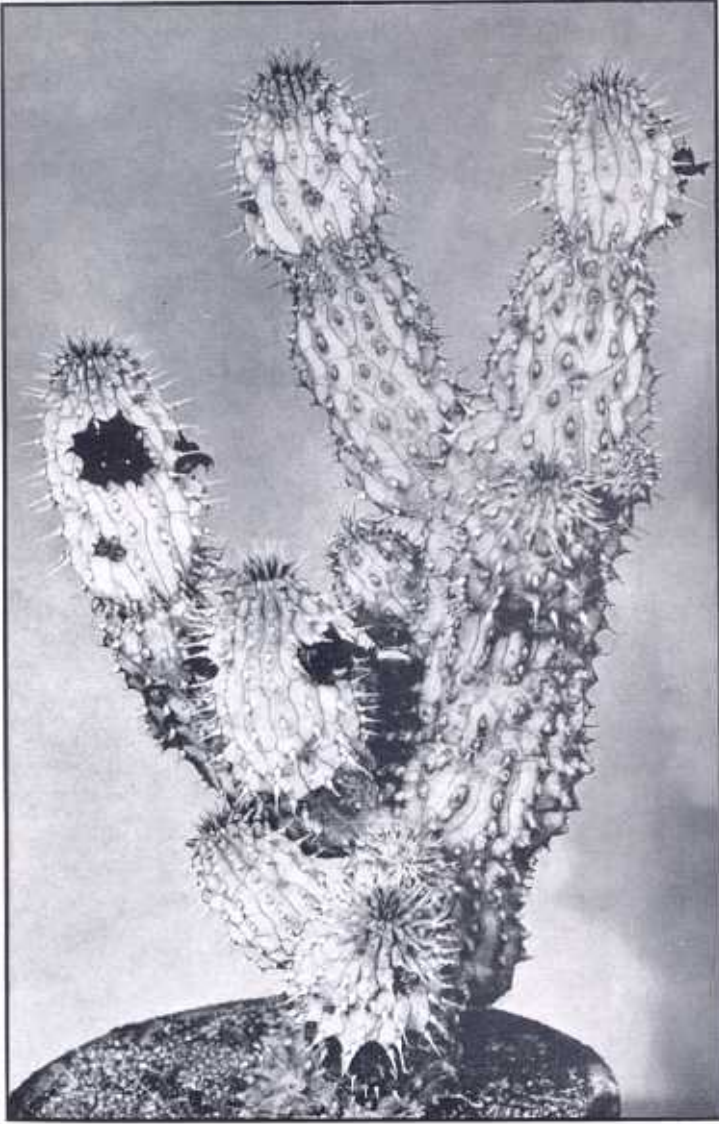


FIG. 1061

Trichocaulon officinale N. E. BrownExample of *Eutrichocaulon* (Key: I), with stem-tubercles tipped with spines or bristles.

Cactoidea is a name derived from that of the first species known of the spineless-stemmed type, *T. cactiforme*. The stems in plants of this section are less numerous than in the *Eutrichocaulons* and not infrequently they are solitary, but their likeness to Cacti is remote. The stem-tubercles are more irregularly disposed than in the *Eutri-*

chocaulons and rarely form straight angles. They are not tipped with spines or bristles, but occasionally they are tipped with transient rudimentary leaves or minute apiculi set in small depressions (see *T. marlothii*). The stems contain a more juicy sap than do those of *Eutrichocaulons*. The flowers appear more nearly at the apex of the stems.

Tricholuma is a telescopic name indicating the relationship which the third section bears alike to *Trichocaulon* and *Caralluma*. In the solitary species, *T. columnare*, the stem-angles have the tubercles produced into short conical teeth, distantly reminiscent of such *Carallumas* as *C. armata*, but the number of angles, eight, is larger than in any species of *Caralluma*, as the genus is now understood. The branching habit of the stems is also more akin to *Caralluma*.

Trichocaulons are called *Ngaaps* by the native Hottentots. This name is applied principally to the spiny-stemmed species, which are mostly edible in the raw state or as preserved in sugar by the colonists. The spineless-stemmed species have a more slimy juice, resembling that of the *Hoodias*, and they are not eaten. The name *Ngaap* is sometimes applied to species in other genera, as explained in Appendix G and Appendix C.

In some instances the different species of *Trichocaulons* are very nearly related, so as to suggest a possible future regrouping into a smaller number. There are also in cultivation plants whose flowers do not exactly agree with the published descriptions of any of the recognized species. The *Trichocaulons* certainly hybridize more generally in the wild state than do the other Stapeliad genera. All in all the variable character of the flowers in matters of detail, combined with their great similarity in the color system of certain groups, not to mention the small size of the flowers and the almost microscopic structure of the coronas, makes the identification of the *Trichocaulons* a puzzling matter. The difficulties involved are complicated by occasional descriptions of similar features in different words by different botanists. Thus *T. meloforme* is described as having a dorsal horn to the inner corona-lobes, with bifid outer corona-lobes; whilst *T. engleri* is said to have simple inner corona-lobes and trifid

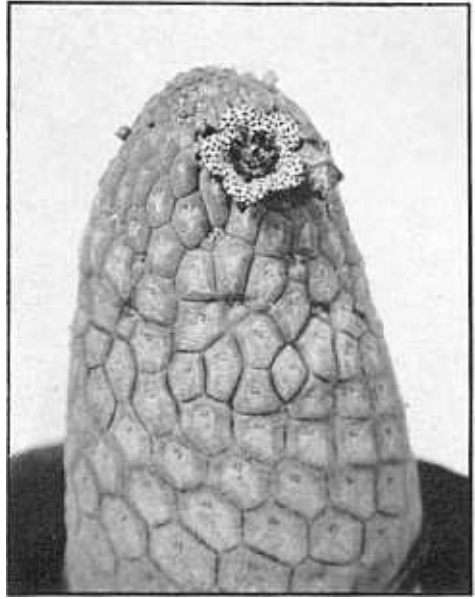


FIG. 1062

Trichocaulon meloforme Marloth x 1.

Example of *Cactoidea* (Key: III), with stem-tubercles not tipped with spines or bristles.

outer corona-lobes. Yet in each case one finds a pair of "mandibles" (see p. 1022) enclosing a smaller central tooth, the trio always opposite an inner corona-lobe. In other words, both species may be regarded as having a dorsal horn to the inner corona-lobes, or as having trifid outer corona-lobes. The point is worth emphasis, because any identification of the *Trichocaulons* requires first of all a clear understanding of the coronas.

We are fortunate to be able to present a Key to the genus by our Collaborator, Carl Luckhoff, which brings the different details of each species into the readiest contrast with those of all the others. But the reader must remember the hybrids and the new species which are so frequently being brought forward and, if he fails to identify his plants, he must resign himself to wait until the genus has been more satisfactorily sifted down.

KEY TO THE GENUS TRICHOCAULON

BY C. LUCKHOFF

Stem-tubercles tipped with spines or bristles (Sect.

Eutrichocaulon):

- A. Corolla with a prominent raised annulus 1. *T. annulatum* ($\frac{3}{4}$ in.)
(Corolla very dark purple-brown; stem-bristles stiff,
2½-3 lin. long)
(Outer corona-lobes bifid, tips diverging)
- B. Corolla with very slightly raised annulus 2. *T. piliferum* ($\frac{1}{2}$ in.)
(Corolla dark purple-brown; stem-bristles stiff, 2-3
lin. long)
(Outer corona-lobes deeply bifid, rarely entire, tips
diverging)
- C. Corolla without trace of a raised annulus:
 - 1. With a corolla-tube $\frac{1}{12}$ to $\frac{1}{4}$ in. deep containing
the corona:
 - a. Corona 1-seriate (Outer corona-lobes absent) . . . 3. *T. triebneri* ($\frac{3}{5}$ in.)
 - b. Corona 2-seriate:
 - i. Corolla dark purple-brown; stem-bristles stiff,
2 lin. long 4. *T. rusticum* ($\frac{1}{4}$ in.)
(Outer corona-lobes deeply bifid, erect)
 - ii. Corolla dark reddish; stem-bristles replaced
by soft hairs 5. *T. decaryi* ($\frac{2}{5}$ in.)
(Outer corona-lobes bifid)
 - iii. Corolla yellow; stem-bristles very stiff, 3 to
5 lin. long 6. *T. alstoni* ($\frac{1}{2}$ in.)
(Outer corona-lobes forming pairs of
erect or incurved teeth)
 - iv. Corolla canary-yellow; stem-bristles stiff, 1½-
2½ lin. long 7. *T. pillansii* ($\frac{1}{2}$ in.)
(Outer corona-lobes forming pairs of
straight equidistant teeth)
 - v. Corolla yellow-green; stem-bristles slender,
2½-3 lin. long 8. *T. grande* ($\frac{2}{3}$ in.)
(Outer corona-lobes forming pairs of
straight subequidistant teeth)
 - 2. With a tiny corolla-tube $\frac{1}{24}$ in. deep:
 - a. Corolla dark purple-brown; stem-bristles 1 to 1½
lin. long 9. *T. pedicellatum* ($\frac{1}{2}$ in.)
(Outer corona-lobes bifid)
 - 3. Without a corolla-tube:
 - a. Corolla wholly purple-brown, or yellow around
corona 10. *T. officinale* ($\frac{1}{2}$ in.)
(Outer corona-lobes 3-toothed, small mid-
dle tooth incurved)
 - b. Corolla with olive-brown tips, then yellow with
red spots and all yellow at the centre, pubescent 11. *T. pubiflorum* ($\frac{1}{2}$ in.)
(Outer corona-lobes 3-toothed, middle
tooth incurved)

c. Corolla brownish-yellow 12. *T. delaetianum* (1/2 in.)
(Outer corona-lobes 3-toothed, middle tooth incurved)

d. Corolla dull yellow 13. *T. flavum* (1/2 in.)
(Outer corona-lobes bifid, "mandibles," tips diverging)

II. Stem-tubercles ending in stout conical teeth (Sect. *Tricholuma*) :

A. Corolla with a tube 1/12 in. deep containing the corona . 14. *T. columnare* (1/4-1/3 in.)
(Corolla yellowish-green with purple to red spots)
(Outer corona-lobes minutely bifid)

III. Stem-tubercles short, broad, not tipped with spines or bristles, or only with minute points or leaves (Sect. *Cactoidea*) :

A. Corolla with a prominent raised annulus 15. *T. kubusense* (1/3 in.)
(Corolla papillate with recurved conical papillae)
(Outer corona-lobes trifid: mandibles with tiny middle tooth)

B. Corolla with a slightly raised disk
(Corolla papillate with whitish papillae) :

1. Outer corona-lobes trifid: teeth diverging with broad tooth between 16. *T. perlatum* (1/3 in.)
2. Outer corona-lobes bifid: teeth diverging 17. *T. cinereum* (1/3 in.)

C. Corolla without trace of a raised annulus:

1. With a distinct corolla-tube containing the corona:

a. Corolla-lobes erect, not spreading 18. *T. sinus-lüderitzii* (1/4 in.)
(Corolla yellow-green, reddish spots)
(Outer corona-lobes trifid: mandibles with tiny middle tooth)

b. Corolla-lobes spreading:

i. Inner corona-lobes not produced beyond the anthers 19. *T. cactiforme* (1/3 in.)
(Corolla pale yellow, blood-red spots)
(Outer corona-lobes bifid: mandibles)

ii. Inner corona-lobes shortly exceeding the anthers:

+ Corolla cream color, dark red spots . . 20. *T. simile* (1/3 in.)
(Outer corona-lobes trifid: middle tooth incurved)

++ Corolla dark red-brown in appearance, from the density of the red-brown dots 21. *T. dinteri* (1/4-1/3 in.)
(Outer corona-lobes bifid: mandibles)

iii. Inner corona-lobes greatly exceeding the anthers:

+ Outer corona-lobes trifid (see p. 993): mandibles with middle tooth almost, if not quite, as long as them . 22. *T. meloforme* ($\frac{1}{3}$ in.) (Corolla yellow, dark maroon spots, tips of lobes maroon)

++ Outer corona-lobes trifid: mandibles with middle tooth at most half as long as them 23. *T. engleri* ($\frac{1}{2}$ in.) (Corolla yellow-green, black-brown spots)

Without a distinct corolla-tube, flattish or saucer-shaped:

a. Outer corona-lobes bifid: mandibles:

i. Corolla white or pale yellow, spotted with red or dark-brown:

+ Inner corona-lobes connivent-erect, tips forming a slender column and not diverging 24. *T. keetmanshoopense* ($\frac{1}{2}$ in.)

++ Inner corona-lobes connivent-erect, with tips diverging 25. *T. marlothii* ($\frac{1}{3}$ in.)

b. Outer corona-lobes trifid 26. *T. pictum* ($\frac{1}{3}$ in.) (Corolla pale yellow, purple-brown spots)

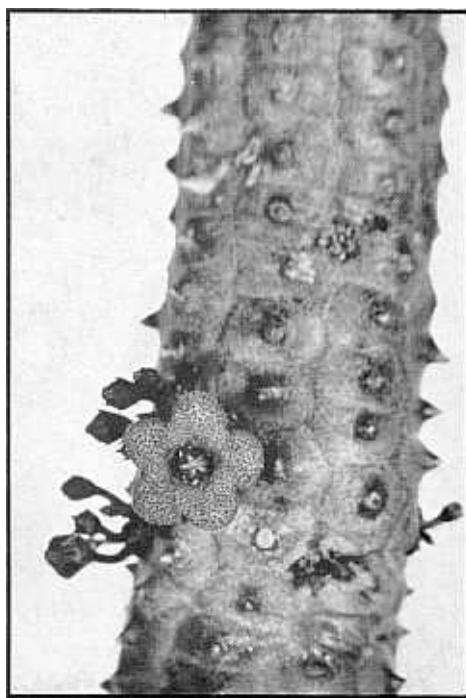


FIG. 1063

Trichocaulon columnare Nel x 1.5

Example of *Tricholuma* (Key: II), with stem-tubercles produced into short conical teeth.



FIG. 1064

Trichocaulon annulatum N. E. Brown

Photo by H. Herre.

1. *Trichocaulon annulatum* N. E. Brown, Flora Cap., iv. i. 889. 1909.

(Description by Dr. Brown. l.c.):

Plant: 6 to 18 in. high, branching at the base; *stems* light glaucous-green, $1\frac{1}{4}$ to $1\frac{3}{4}$ in. thick, cylindric, with 23 to 30 vertical series of tubercles tipped with stiff light brown (darker when young) bristles $2\frac{1}{2}$ to 3 lin. long;

Flowers: subsessile in the grooves between the tubercles;

Sepals: 1 to $1\frac{1}{4}$ lin. long, subulate-acuminate from a broadly ovate base, glabrous;

Corolla: about 10 lin. in diameter, rotate, lobed to less than half-way down, with a very prominent raised *ring* forming a cup enclosing the corona on the disk, otherwise without a distinct tube, smooth and glabrous on the back, densely covered with conical papillae all over the very dark

purple-brown inner surface, except at the bottom of the cup around the corona, most of them with a minute hair directed at a right angle from their apex; lobes $2\frac{1}{2}$ lin. long, 4 to $4\frac{1}{2}$ lin. broad, very spreading, very broadly deltoid-ovate, shortly cuspidate-acute, with recurved margins;

Outer corona: large, nearly 2 lin. high, rising almost to the level of the rim of the cup, glabrous, very dark purple-brown, cup-like at the base, with 5 rather broad lobes, divided above their erect concave basal part into two sub lanceolate diverging and obliquely recurved-spreading teeth $\frac{2}{3}$ lin. long and $\frac{1}{3}$ lin. broad;

Inner corona: lobes about $\frac{1}{2}$ lin. long, linear or deltoid-linear, obtuse, dark purple-brown, closely incumbent on the backs of the anthers and equaling or slightly exceeding and incurved over their tips.

Type locality: Cape Prov.: Jansenville Distr.: Klipplaat.

Distribution: Also in Willowmore Distr.: hills near Willowmore.

This *Trichocaulon* was discovered by H. Lee, a sheep farmer, in the eastern section of the Great Karroo, near Klipplaat, in 1908. Its flowers are even darker purple-brown in color than those of *T. piliferum* and as densely papillate within. As the name indicates, the corolla has a raised

annulus, much more prominent than the slight elevation of the fabric around the mouth of the tube in *T. piliferum*, and this annulus forms a cup which encloses the corona, but otherwise there is no distinct central tube. The outer corona is formed of bifid lobes with the tips diverging.



FIG. 1065

Trichocaulon annulatum N. E. Brown

From a photograph of the type plant in the Bolus Herbarium, Kirstenbosch

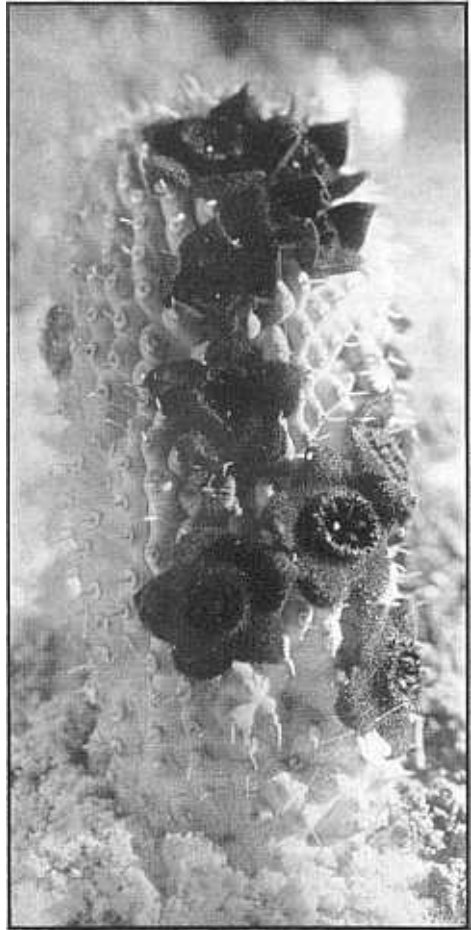


FIG. 1066

Trichocaulon annulatum N. E. Brown x 1.2

From Willowmore, C. P. Photo by Carl Luckhoff.

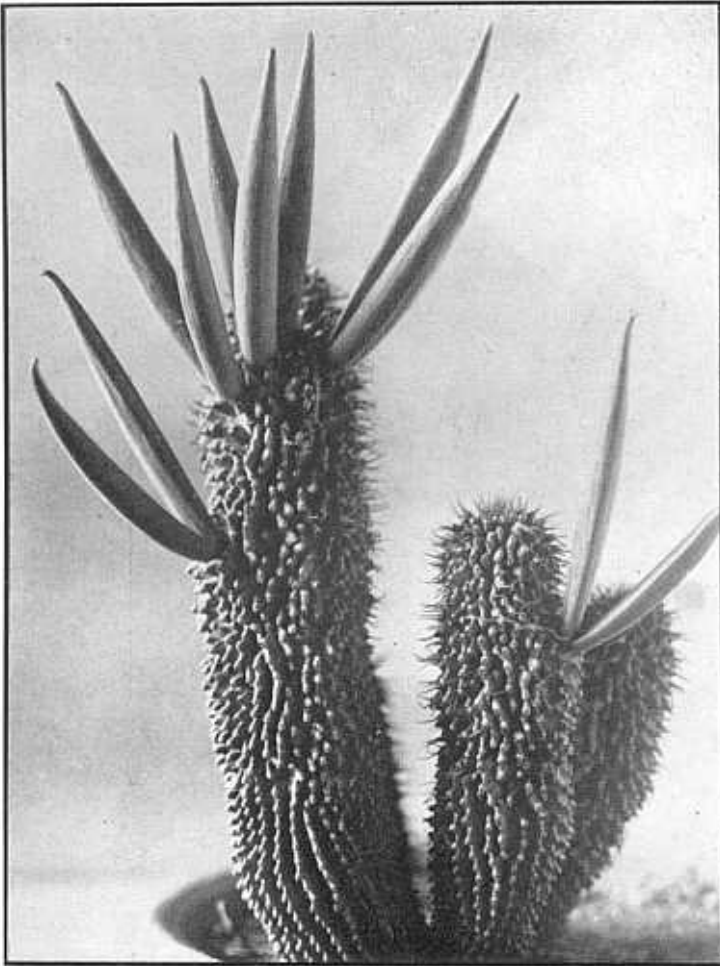


FIG. 1067

Fruiting stems of *Trichocaulon piliferum* N. E. Brown

Photo by Carl Luckhoff.

2. *Trichocaulon piliferum* (Linnaeus fil.) N. E. Brown, Journ. Linn. Soc., xvii. 164. 1878.

Stapelia pilifera Linnaeus fil., Suppl., 171. 1781.

Piarranthus piliferus Sweet, Hort. Brit., 2 Ed., 359. 1830.

(Description by Dr. Brown, Flora Cap., iv. i. 890):

Plant: 6 to 8 in. high, branching at the base; *stems* cylindric or slightly clavate-cylindric, $1\frac{1}{2}$ to 2 in. thick, with about 25 vertical series of crowded tubercles, each ending in a stiff brown bristle 2 to 3 lin. long, dull dark green, somewhat glaucous;

Flowers: 1 to 3 together in the grooves between the tubercles;

*Pedice*l: about $\frac{3}{4}$ lin. long, glabrous;

Sepals: 1 to $1\frac{1}{2}$ lin. long, subulate-acuminate from an ovate base, glabrous;

Corolla: in bud somewhat flattened at the top and very abruptly cuspidate; when expanded $\frac{1}{2}$ to $\frac{2}{3}$ in. in diameter, glabrous and smooth on the back, densely papillate-tuberculate all over the limb and lobes on the inner face, not ciliate, dark purple-brown; *tube* about 1 lin. long, cup-



PLATE XXXI.

Trichocaulon piliferum N. E. Brown

From the original water color drawing by Miss Cythna Lett
for the Flowering Plants of South Africa, 1935.

like, circular or subpentagonal at the mouth; *limb* spreading, lobed to $\frac{3}{4}$ of the way down, slightly raised around the mouth of the tube; *lobes* 2 to 3 lin. long and as much in breadth, broadly deltoid-ovate, cuspidate-acuminate into a short subulate point;

Outer corona: apparently consisting of 5 spreading deeply bifid (rarely entire) oblong, ovate or deltoid-ovate acute lobes about $\frac{2}{3}$ lin. long, opposite the anthers, really formed by the widely diverging adjacent segments of 2 lobes being connate behind the inner corona-lobes for nearly half their length at the base or rarely up to the apex, glabrous, dark purple-brown;

Inner corona: lobes $\frac{1}{4}$ lin. long, linear, obtuse, closely incumbent on the backs of the anthers and shorter than them, dorsally connected at the base to the outer corona, dark purple-brown.

Type locality: Cape Prov.: Oudtshoorn Distr.: Karroo, the other side of Attaqua Kloof.

Distribution: Also from Prince Albert Distr.: near Weltevrede; near Prince Albert; Calvinia or Sutherland Distr.: Karroo below the Roggeveld; Riversdale Distr.: Marthinuskloof; Ladismith Distr.; Swellendam Distr.: near Barrydale and the Warm Water Berg; Willowmore Distr.: near Willowmore; South West Africa: Great Namaqualand: Arasabkuppe.

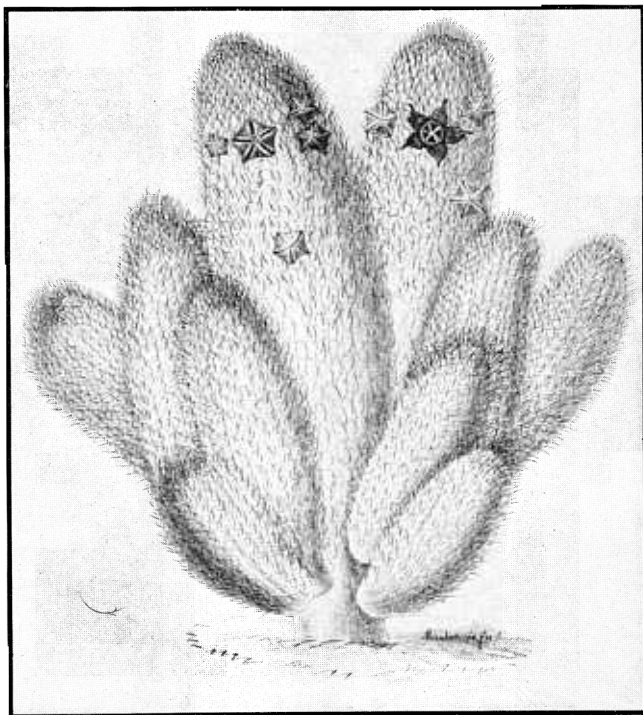


FIG. 1068

Trichocaulon piliferum N. E. Brown x 0.5

From Masson: *Stapeliae Novae*, 1796.

The "hair-bearing *Trichocaulon*" was the first species of the genus to be discovered, about 1773, but the genus itself was not established until more than a century later. It was collected by Thunberg in the Little Karroo, inland from Mossel

Bay, and it is fairly frequent still at numerous points in the southerly karroid areas. According to Dr. Paul Range, it has also been found in South West Africa. The half-inch flowers are dark purple-brown on the inner corona face and densely papillate.

The corona sets in a cup-shaped tube, of which the mouth forms a slightly raised annulus on the corolla-disk. The outer corona-lobes are very spreading, with the divergent teeth arranged in pairs behind the inner corona-lobes. Masson wrote that the stems were eaten by the Hottentots. These stout stems, according to Dr. Marloth, are 2 inches thick and up to 2 feet high. "This is the real ghaap of the natives," continued Dr. Marloth, "who use it as a substitute for food and water. The sweet sap reminds one of licorice and, when on one occasion thirst compelled me to follow the example of my Hottentot guide, it saved further suffering and removed the

pangs of hunger so efficiently that I could not eat anything for a day after having reached the camp."

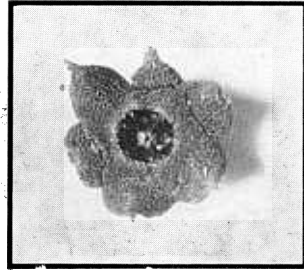


FIG. 1069
Trichocaulon pi
N. E. Brown

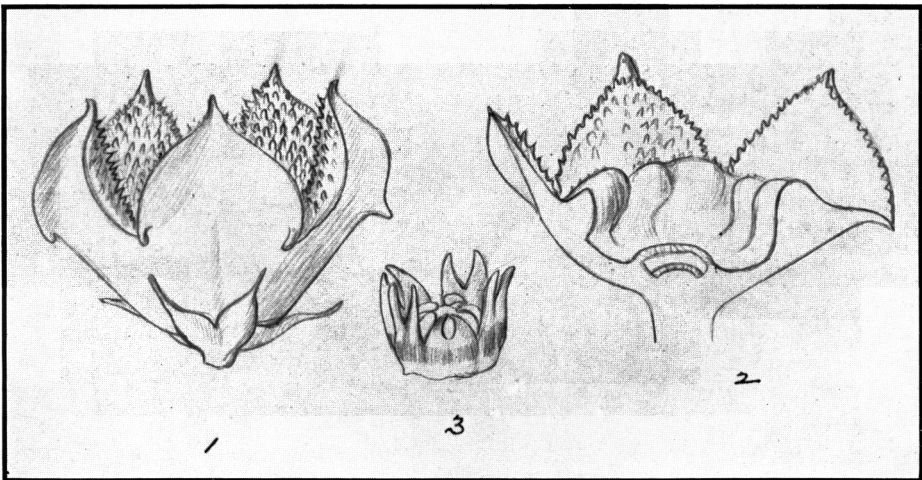


FIG. 1070
Trichocaulon piliferum N. E. Brown
Enlargement of the corolla and corona, from a drawing by Miss Cythra
: Flowering Plants of South Africa, 1935.



FIG. 1071

Trichocaulon triebneri Nel x 0.3

Photo by H. Herre, Kakteenkunde, 1935

3. *Trichocaulon triebneri* Nel, Kakteenkunde, 117. 1935.

(Description by Prof. G. C. Nel, l.c., translated from the Latin) :

Plant: highly succulent, bluish-grey-green, 30 cm. high, almost uniformly 4 cm. thick from base to apex, branching freely alike from the base and above, with 15 to 16 angles and rather deep grooves 4 to 5 mm. wide; angles with rather prominent tubercles, tipped with almost white spines 5 mm. long, the spines absent from the older parts;

Flowers: in fascicles of 8 to 10, from the grooves at the upper part of the stems;

Pedicle: short;

Sepals: ovate at the base, subulate-acute at the tips, glabrous;

Corolla: 1.5 cm. in diameter, rotate, with a *tube* almost 4 mm. long, yellow at the bottom; outside finely papillate; blackish-red-purple; *lobes* deltoid-acuminate, with a suggestion of teeth between the lobes; lobes and tube covered with many small obconical papillae, tipped with short purple-red spines, which are straight or bent towards the apex;

Outer corona: absent;

Inner corona: lobes dark purple-black, subquadrate, with two very small wing-like dorsal projections, gently incumbent upon the anthers and not produced above them.

Type locality: South West Africa: Swakop, near Okandu, 75 miles west of Swakopmund.

Distribution: Also from Karibib.

"Triebner's *Trichocaulon*" is named for its discoverer, W. Triebner of Windhoek, who collected it in November, 1933, about half-way between Windhoek and Swakopmund, in tropical South West Africa. It appears to be most nearly related to *Trichocaulon pedicellatum*. Like that species, its flowers have a short pedicel. The corolla has a deeper central tube, and the corona

differs from that of all other *Trichocaulons* by the absence of any outer series of lobes. All that remains of an outer corona will be found in the two very small wing-like dorsal projections of the inner corona-lobes, which correspond perhaps to vestiges of the bifid outer corona-lobes of *T. pedicellatum*. The almost black color of the entire flower is very striking.

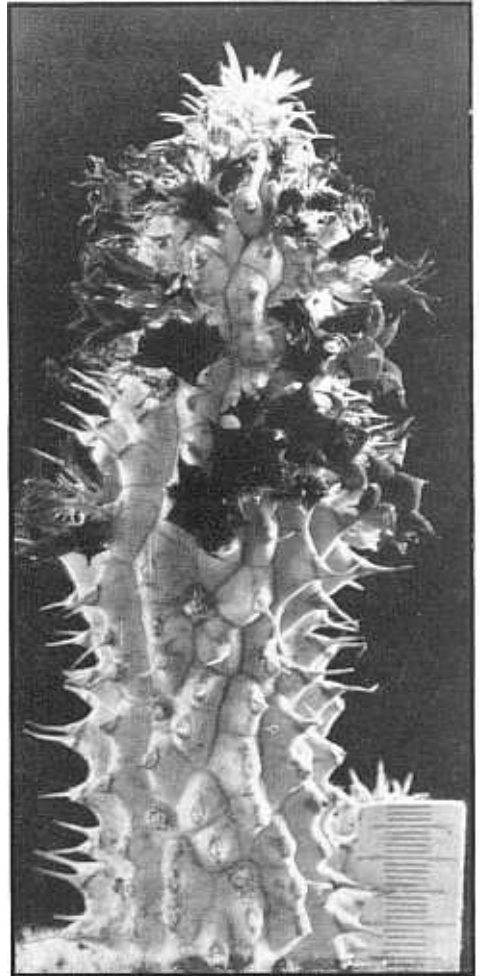


FIG. 1072

Trichocaulon triebneri Nel x 1.

Photo by H. Herre.

4. *Trichocaulon rusticum* N. E. Brown, Flora Cap., iv. i. 891. 1909.

(Description by Dr. Brown, l.c.):

Plant: about 5 in. high, similar to *T. piliferum*; *stems* with 17 to 20 (or more?) vertical series of conical tubercles, tipped with a slender dark brown spine or stiff bristle about 2 lin. long, glaucous-green or purple-tinted;

Pedicel: about 1 lin. long, glabrous;

Sepals: $\frac{3}{4}$ to 1 lin. long, ovate, acuminate, glabrous;

Corolla: with a distinct campanulate *tube* about 1 lin. long, glabrous outside and within; *lobes* spreading, about $\frac{1}{8}$ in. long and broad, deltoid-ovate, acute, glabrous on the back, with a microscopic pubescence on the inner face, not ciliate, dark purple-brown (*Marloth*);

Outer corona: of 5 erect deeply bifid lobes or pairs of deltoid-ovate obtuse teeth about $\frac{1}{4}$ lin. long, alternating with the anthers and rising to about the level of the top of the staminal column;

Inner corona: lobes about $\frac{1}{4}$ lin. long, linear-oblong, obtuse, closely incumbent on the backs of and about half as long as the anthers, with a broad dorsal connection with the outer corona at their base.

Type locality: Cape Prov.: Kenhardt Distr.: Kenhardt.

Distribution: Not further known.

The "rustic *Trichocaulon*" is one of five *Trichocaulons* discovered by Dr. Marloth, who collected it near Kenhardt, in the very north of the Cape Province, about 40 miles south of the Orange River. The specific name may refer to the *unadorned* flowers, which are wholly dark purple brown, like those of *Trichocaulon piliferum*. They are only about $\frac{1}{4}$ -inch in diameter, the inner

surface of the corolla covered with a minute pubescence, which becomes invisible when the flowers are wet. All trace of an annulus has disappeared, being replaced by a very small campanulate tube. The outer corona is formed of five deeply bifid lobes, which alternate with the lobes of the inner corona.

Trichocaulon decaryi

5. *Trichocaulon decaryi* Choux, Ann. Mus. Colon. Marseille, No. 2. 10. 1932.

(Description based on that by Prof. P. Choux, l.c., translated from the Latin):

Stems: leafless, densely tufted, erect, up to 15 to 18 cm. (more rarely 20 cm.) high, fleshy, 7 to 10 mm. thick, densely covered with very numerous conical tubercles, bearing soft hairs at the tips;

Flowers: from the very base of the stems;

Pedicel: 5 to 7 mm. long;

Sepals: glabrous, ovate-subulate, 5 mm. long, 1.6 to 1.8 mm. broad;

Corolla: campanulate, dark reddish, fleshy, 10.5 to 11 mm. long and about 11 mm. in diameter; inside with short thick cylindrical hairs; *tube* 6.5 to 7.5 mm. long; *lobes* 3.5 to 4 mm. long, 6 mm. broad at the base, triangular, apiculate at the apex;

Outer corona: tubular-campanulate, 4 mm. high, 2.6 mm. in diameter, exceeding the staminal column, lobes bifid at the apex; segments triangular, obtuse, 1.4 to 1.5 mm. long;

Inner corona: shorter, lobes triangular, adnate at the base to the outer corona and closely incumbent upon the anthers at the tip.

Type locality: Madagascar: Fort-Dauphin Province: on the bush-covered slopes of Mt. Angavo, north of Ambovombé.

Distribution: Also recorded between Behara and Tranomaro, north-east of Ambovombé.

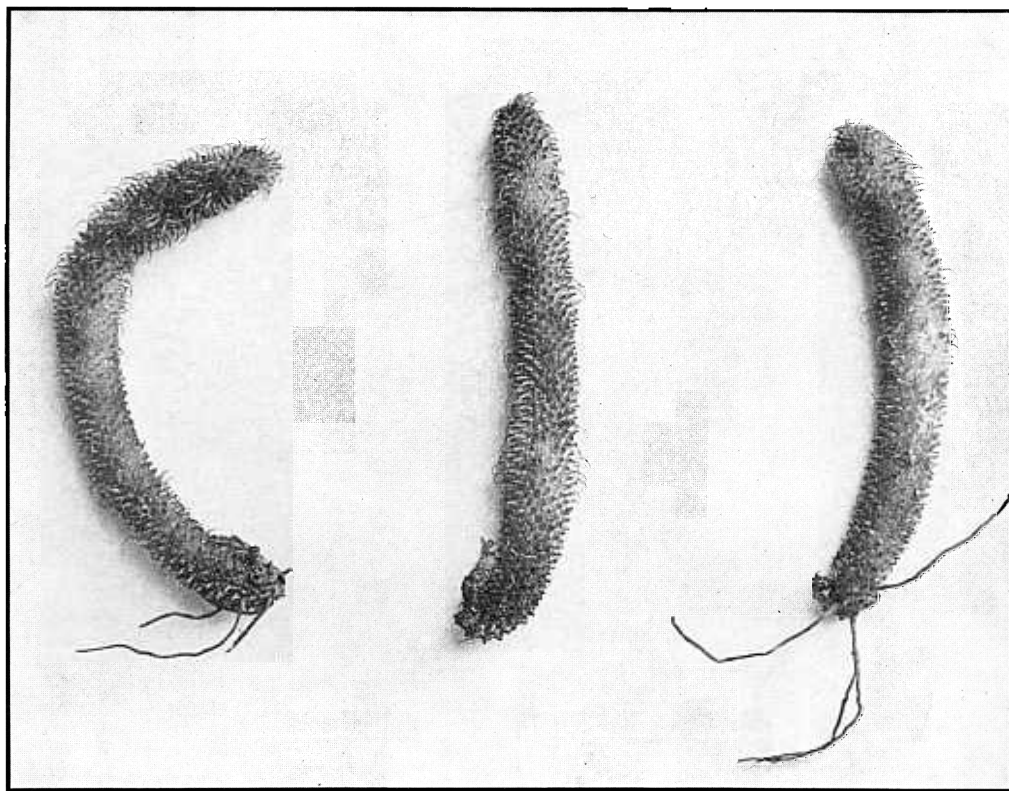


FIG. 1073

Trichocaulon decaryi Choux

Photo by P. Choux of the stems only in Ann. Mus. Colon. de Marseille, 1932.

"Decary's *Trichocaulon*," discovered by Raymond Decary in southern Madagascar in April, 1931, is a very remarkable and highly specialized embodiment of the genus. The stems contain an extremely bitter juice, wholly unlike the sweet licorice-like sap of the edible ghaaps. The stem tubercles are quite small, conical in shape and irregularly disposed, many of them in spiral rows. The hairs with which they are tipped are whitish during the dry season, turning rapidly green after the least rain, and at such times the tufted stems appear more or less moss-like. While the irregular disposition of the stem tubercles recalls some stems we have seen of *Trichocaulon*

piliferum and other *Eutrichocaulons*, still the growth of the stems in dense tufts, the proportionately more slender build of individual stems and the tubercles tipped with soft "hairs" rather than with hard bristles are all more suggestive of the unique *Huernia*, *H. pillansii*, than of any orthodox *Trichocaulon*. The flowers are borne in small fascicles from the base of the stems, again recalling the *Huernias*; and the corolla also presents a hint of the *Huernias* in having small projecting points at the sinuses between the lobes, but these are never fully developed and in some flowers are wholly absent. The shape of the flowers is campanulate, the color reddish-brown, the size under a half-inch, the inner surface covered with short thick cylindrical hairs. The corona is the decisive character in determining the classification of the species as a *Trichocaulon* rather than as a *Huernia* of the *H. pillansii* type. The outer corona is composed of a tubular-campanulate united base, from which the lobes presently separate, each lobe dividing into two obtuse triangular segments, which are roughly parallel and when spread out curve together at the apex. The inner coronalobes are very short and incumbent upon the anthers. The distinctive character of *T. decaryi* and the distance of its habitat from that of any other *Trichocaulons* suggest the possible future transfer of the plant to a new genus of its own.



FIG. 1074

Trichocaulon decaryi Choux

Fragments of sepals, above, and of outer corona-lobes, below. Photo by P. Choux in Ann. Mus. Colon. de Marseille, 1932.

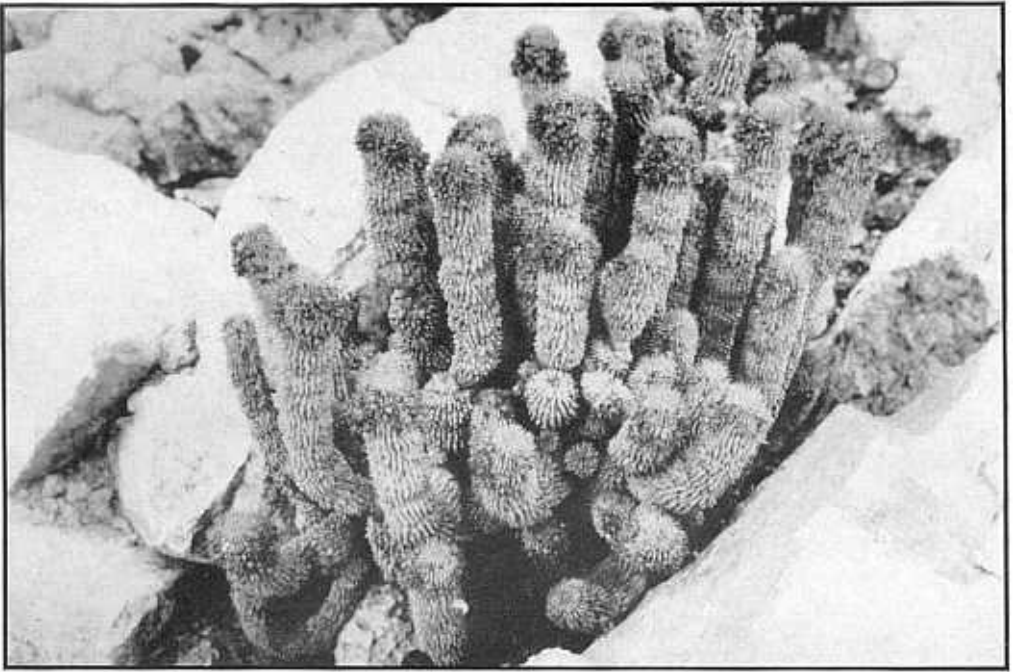


FIG: 1075

Trichocaulon alstoni N. E. Brown

In natural surroundings near Steinkopf, Little Namaqualand. Photo by H. Herre.

6. *Trichocaulon alstoni* N. E. Brown, Kew Bull., 166. 1906.

(Description by Dr. Brown, Flora Cap., iv. i. 891):

Plant: about 6 in. high, branching at the base; *stems* about $1\frac{1}{2}$ to $1\frac{3}{4}$ in. thick excluding the spines, many-angled, glabrous and apparently glaucous; angles with closely placed tubercles tipped with a stiff spine 3 to 5 lin. long;

Flowers: in small fascicles between the angles of the stem;

Bracts: minute, subulate;

*Pedice*l: $1\frac{1}{2}$ to 2 lin. long, glabrous;

Sepals: erect, $1\frac{1}{2}$ lin. long, $\frac{2}{3}$ lin. broad, ovate, acuminate, glabrous;

Corolla: glabrous and smooth inside and out, yellow, acutely pointed in bud; *tube* 2 to $2\frac{1}{4}$ lin. long and about the same in diameter at the mouth, campanulately funnel-shaped; *lobes* 2 to $2\frac{1}{4}$ lin. long, $1\frac{1}{2}$ to $1\frac{2}{3}$ lin. broad at the base, ovate, very acute or somewhat acuminate, ascending in the dried state, probably spreading when alive;

Outer corona: cup-shaped at the base, subequally 10-toothed or with 5 pairs of teeth behind the inner corona-lobes, glabrous; teeth $\frac{1}{3}$ to $\frac{2}{5}$ lin. long, deltoid or subulate, obtuse or acute, erect or incurved over the staminal column;

Inner corona: lobes $\frac{1}{3}$ lin. long, oblong, obtuse, incumbent on the backs of the anthers and not produced beyond them, dorsally adnate at the base to the outer corona.

Type locality: Cape Prov.: Little Namaqualand: in stony fields near Namies, 3000 feet elevation.

Distribution: Also in Little Namaqualand: Steinkopf-Umdaus; and Steinkopf-Hangpaal.

This species, from the north-westerly portion of Little Namaqualand, was named for its discoverer, Capt. E. Alston of Ceres. The stems are about 6 inches high, the tubercles tipped with stiff spines, longer and stouter than those of the other *Eutri-*

chocaulons equipped with a central tube. The flowers are yellow and may be distinguished by their being wholly glabrous inside and out. The outer corona-lobes are deeply bifid.



FIG. 1075-A

Trichocaulon alstoni N. E. Brown

From a photograph of a specimen in the Herbarium of the Berlin Dahlem Botanic Museum, collected by Capt. E. Alston.

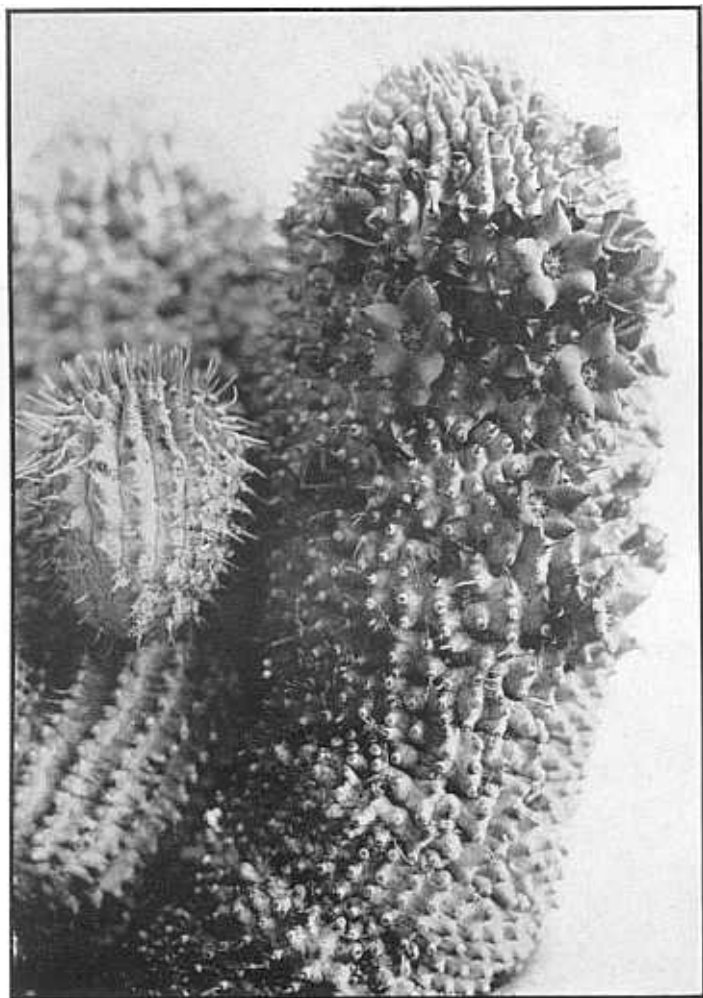


FIG. 1076

Trichocaulon pillansii N. E. Brown x 1

Photo by Carl Luckhoff.

7. *Trichocaulon pillansii* N. E. Brown, Gard. Chron., xxxv. 242. 1904.

(Description by Dr. Brown, Flora Cap., iv. i. 892):

Plant: similar to *T. piliferum*; *stems* 4 to 10 in. high, $1\frac{1}{4}$ to $2\frac{1}{4}$ in. thick, with 25 to 30 series of tubercles ending in stiff pale brown (turning to grey) bristles $1\frac{1}{2}$ to $2\frac{1}{4}$ lin. long, "dull green, hardly glaucous on the young growth, flowering nearly all over" (*Pillans*);

Flowers: 1 to 3 in a fascicle;

*Pedice*l: $\frac{1}{2}$ to $\frac{3}{4}$ lin. long, $\frac{3}{4}$ lin. thick, glabrous;

Sepals: 1 to $1\frac{1}{4}$ lin. long, ovate, very acuminate, glabrous;

Corolla: $4\frac{1}{2}$ lin. in diameter, bright canary-yellow, pinkish-green outside (*Pillans*), glabrous and smooth outside and within the tube, densely papillate and thinly and very minutely puberulous (always?) on the inner face of the lobes, not ciliate; *tube* distinctly cup-shaped or campanulate, 1 to $1\frac{1}{3}$ lin. long, $1\frac{1}{2}$ lin. in diameter at the mouth inside; *lobes* spreading, $1\frac{1}{3}$ to $1\frac{1}{2}$ lin. long, $1\frac{1}{2}$ to $1\frac{3}{4}$ lin. broad, broadly deltoid-ovate, very acute;

Outer corona: shortly cupular at the base, equally 10-toothed, light yellow; teeth $\frac{1}{4}$ to $\frac{1}{3}$ lin. long, deltoid, acute or obtuse, ascending-spreading, quite straight and equidistant, not approaching each other in pairs;

Inner corona: lobes $\frac{1}{4}$ lin. long, linear-oblong, obtuse, about half as long as the anthers and closely incumbent upon their backs, dorsally connected to the outer corona, light yellow;

Follicles: only developed upon the young growth (*Pillans*), erect, subparallel, $3\frac{1}{4}$ in. long and $3\frac{1}{2}$ to 4 lin. thick in the specimen seen, fusiform, tapering into a beak, incurved-hooked at the apex, smooth, glabrous; *seeds* about 2 lin. long, scarcely 1 lin. broad, ovate or oblong-ovate, with thick margins, often incurved on one side, smooth, glabrous, light brown, with paler margins.

Type locality: Cape Prov.: Laingsburg Distr.: 6 to 8 miles west of Laingsburg, at Zout Kloof Farm.

Distribution: Also near Whitehill: southern slope of Ngaap Kop; and near Matjesfontein.

Discovered by Mr. Pillans in the westerly Great Karroo. It is said to have been fairly frequent formerly, sufficiently so to give the name to one of the hills in the Witteberge, Ngaap Kop (*Trichocaulon Hill*); but to-day it has been almost exterminated through the zeal of collectors and because of its edible and supposedly medicinal properties. In habit it is similar to *Trichocaulon piliferum*, the stems with 25 to 30 rows of tubercles tipped with pale brown bristles. The stems are 4 to 10 inches tall. and in a

"larger variety" (*Trichocaulon pillansii* var. *major* N. E. Brown, Gard. Chron., xxxv. 242. 1904) they are 9 to 13 inches. The flowers also vary in size, under the $\frac{1}{2}$ -inch diameter in the type, slightly over it in the variety. They are canary-yellow in color on the inner face, pinkish-green outside, and densely papillate on the inside of the corolla-lobes. The outer corona is 10-toothed, the teeth quite straight and equidistant in the type, in slightly diverging pairs in the variety.

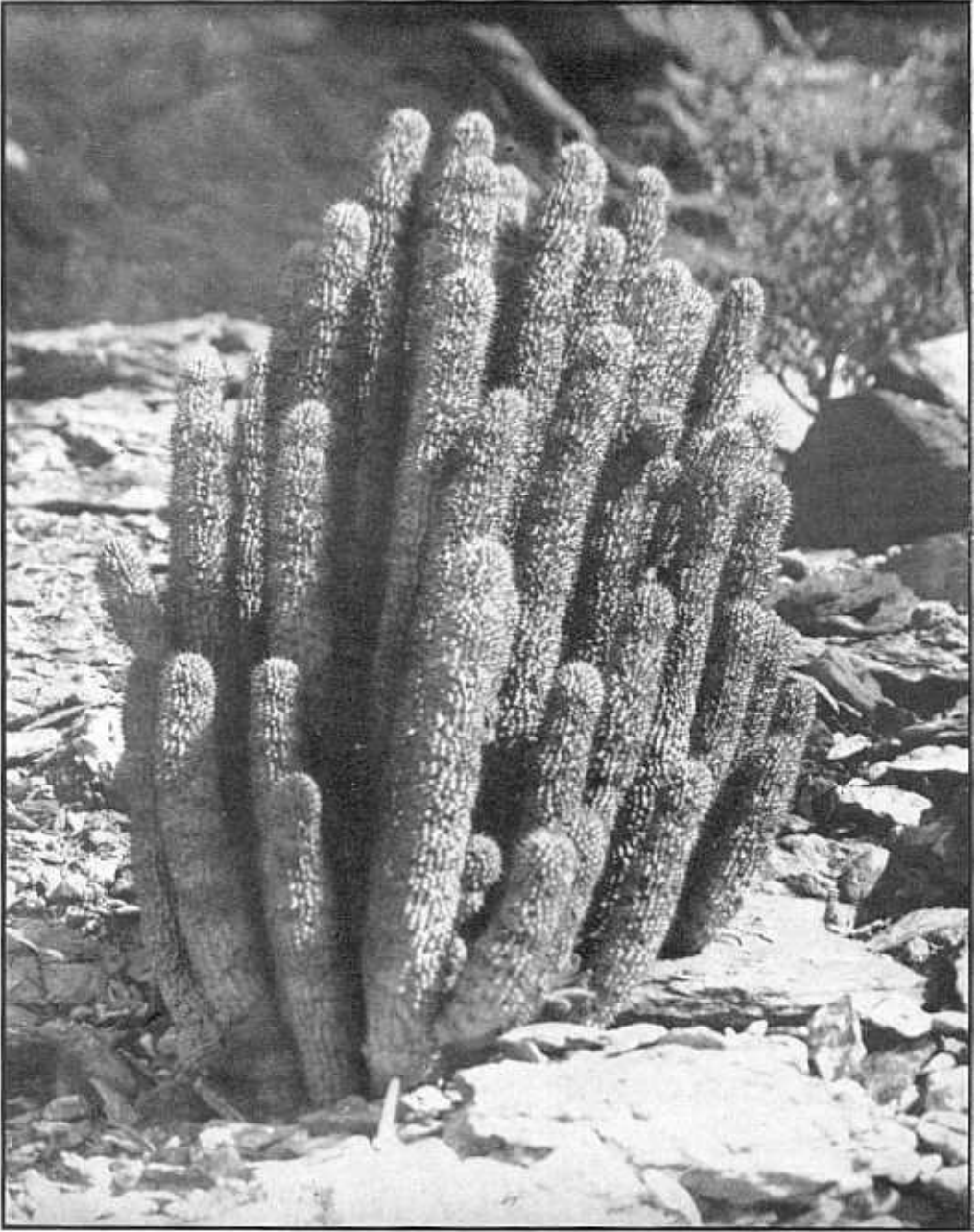


FIG. 1077

Trichocaulon sp. unidentified

A typical example of the large *Trichocaulons* growing on shale ledges at Obib, near Sendlingsdrift, South West Africa. This, an average sized specimen, is over 6 feet in height. Photo by Carl Luckhoff.

8. *Trichocaulon grande* N. E. Brown, Flora Cap., iv. i. 892. 1909.

(Description by Dr. Brown, l.c.):

Plant: 1½ to 2 ft. high, branching at about 4 in. above the ground; *stems* about 2 in. thick, with 30 or more vertical series of tubercles, each tipped with a very stiff pale brown (when young dull purplish) bristle or slender spine 2½ to 3 lin. long, glabrous, glaucous-green;

Flowers: 1 to 3 together, developing successively;

*Pedice*l: ¾ to 1 lin. long, glabrous;

Sepals: ¾ to 1 lin. long, ovate-lanceolate, very acuminate, glabrous;

Corolla: 7 to 8 lin. in diameter, glabrous and smooth outside and within the tube, densely papillate on the disk and lobes of the inner face, not ciliate, greenish-yellow; *tube* campanulate or cup-shaped, about 1½ lin. long and as much in diameter at the mouth, which is distinctly pentagonal and has a slight inwardly projecting rim; *lobes* spreading, with recurved tips, 2½ to 3 lin. long, 2½ lin. broad, very broadly ovate, shortly and somewhat abruptly acuminate;

Outer corona: shortly cupular at the base, divided into 10 narrowly deltoid-subulate acute teeth ⅔ lin. long, which are straight, subequidistant, ascending-spreading and rising to the mouth of the corolla-tube, yellow;

Inner corona: lobes about ⅔ lin. long, subulate, incumbent upon the backs of the anthers at the base, produced beyond them for half their length in a connivent-erect column rising to the mouth of the corolla-tube.

Type locality: Cape Prov.: Laingsburg Distr.: 12 miles south of Laingsburg, on the main road to Ladismith.

Distribution: Not further known.

The "great *Trichocaulon*," discovered by N. S. Pillans 12 miles south of Laingsburg, has very large stems up to two feet high, with 30 or more rows of tubercles tipped with very stiff bristles. The flowers are greenish-yellow, densely papillate on the inner face. The corolla-tube is bell-shaped, its mouth pentagonal with a slight inwardly projecting rim. The outer corona-lobes are divided into two straight narrow teeth; the inner corona-lobes rise above the anthers in a shaft like those of *T. engleri*. *T. grande* is not in cultivation, and we have

been unable to procure a photograph of it. It shares with two incompletely known plants the distinction of being the largest of all *Trichocaulons*. One of these is *T. halenbergense*. The other is a species from the shale hills at Obib, near Sendlingsdrift, South West Africa. Carl Luckhoff, who has sent us a photograph of this plant, says that it reaches an immense size. One specimen, which could not be photographed because of the failing light, "was fully the size of a 5-seater automobile." The flowers were not seen.

9. *Trichocaulon pedicellatum* Schinz, Verhandl. Bot. Ver. Brandenb., xxx. 266. 1888.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 490):

Stems: dwarf, glabrous, cylindric, as thick as the thumb, many-angled; angles tubercled, each tubercle terminated by a bristle 1 to $1\frac{1}{2}$ lin. long;

Flowers: 1 to 4 in fascicles;

*Pedice*l: 2 to $2\frac{1}{2}$ lin. long, glabrous;

Sepals: $\frac{3}{4}$ to 1 lin. long, lanceolate, acuminate, glabrous;

Corolla: about 4 to 5 lin. in diameter, rotate; *tube* small, $\frac{1}{2}$ lin. long; *lobes* very spreading 2 lin. long, 1 to $1\frac{1}{4}$ lin. broad, lanceolate, acuminate, glabrous, papillate within, dark purple-brown;

Outer corona: lobes arising from the middle of the $\frac{1}{2}$ -lin.-long staminal column and slightly overtopping it, bifid, purple-brown, glabrous; teeth of the lobes $\frac{1}{4}$ lin. long;

Inner corona: lobes $\frac{1}{3}$ lin. long, linear, obtuse, incumbent on the backs of the anthers and longer than them, dorsally adnate to the lobes of the outer corona, purple-brown, glabrous;

Anthers: incumbent on the top of the style, which is truncate, depressed and covered by the inner corona-lobes.

Type locality: South West Africa: western Hereroland: probably from the neighborhood of Hope Mine.

Distribution: Namib Desert.

The "pediceled *Trichocaulon*" is a tropical species from Hereroland, discovered about 1886 by F. M. Stapff. The stems are small and have been described as no thicker than one's thumb; but when alive they are materially larger. The flowers are borne, as the name indicates, on distinct pedicels, $\frac{1}{4}$ -inch long. This is not a great length in itself, but the *Trichocaulons* (all except *T. decaryi*) either have sessile flowers or very short pedicels indeed. The flowers are under a half inch in diameter, dark purple-brown and papillate. They have a tiny central tube about $\frac{1}{24}$ of an inch deep. The plant is a connecting link between the *Eutrichocaulons* and the *Cactoideas*. As our separation of these sections is based solely on the presence or absence of bristles on the stem tubercles, *T. pedicellatum* must class in the spiny group, although the bristles are very small and weak; but the habit and general features of the plant, its consistency and the form of the tubercles, all suggest a closer relation to the spineless group. "The nearly black flowers," writes Prof. Dinter, "deviate strongly from the



FIG. 1078

Trichocaulon pedicellatum Schinz x 0.5

Photo by W. Triebner of a plant from the Namib, South West Africa.

usual *Trichocaulon* pattern by their deeply cut corolla-lobes." And Mr. Triebner, who rediscovered the species near Cape Cross in



PLATE XXXII.

Trichocaulon pedicellatum Schinz

From an original water color drawing
by Carl Luckhoff.

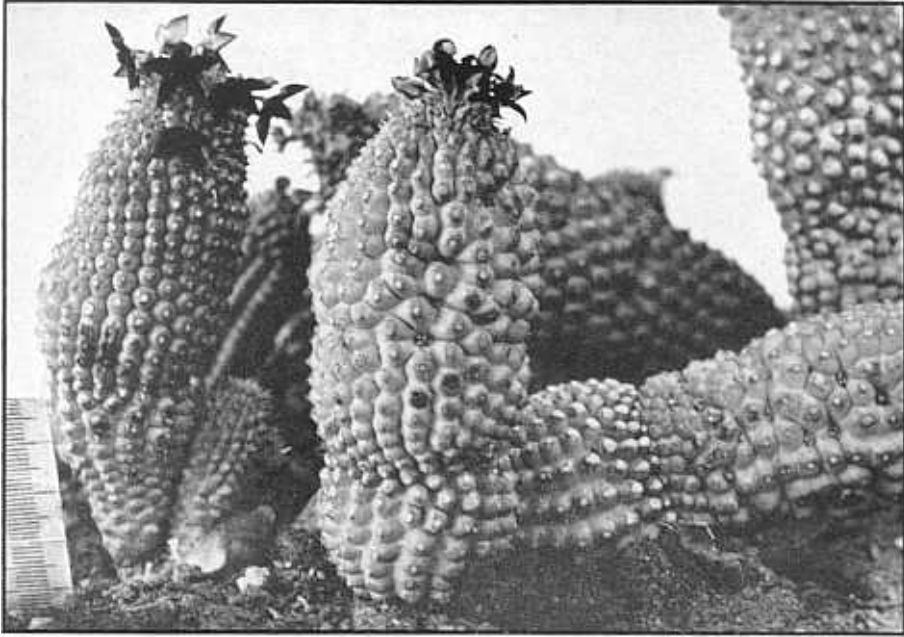
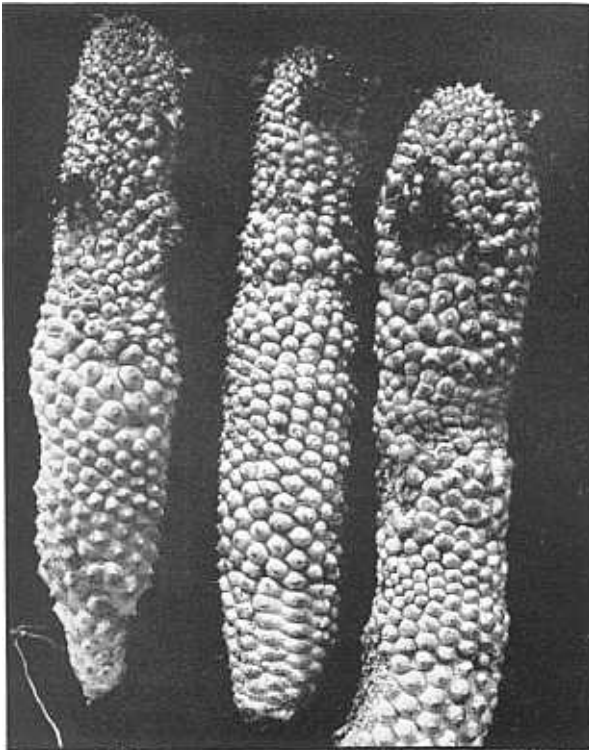


FIG. 1079

Trichocaulon pedicellatum Schinz

Photo by H. Herre.



1930, adds: "The plant grows on the slopes of wholly arid diabase hills, which with their black color appear entirely dead. The plants themselves are black like the rocks, and only turn greenish in cultivation. This protective coloring, indistinguishable from that of the rocks, makes the plants extremely difficult to find."

FIG. 1080

Trichocaulon pedicellatum Schinz

Photo by Prof. Dinter.

10. *Trichocaulon officinale* N. E. Brown, Kew Bull., 264. 1895.

(Description by Dr. Brown, Flora Cap., iv. i. 893):

Stems: about 5 in. high, like those of *T. piliferum*, but apparently with fewer vertical series of spine-tipped tubercles;

Flowers: 1 to 2-or perhaps more together between the tubercles on the sides of the stems;

*Pedice*l: $\frac{1}{2}$ to 1 lin. long, glabrous;

Sepals: 1 to $1\frac{2}{3}$ lin. long, ovate or ovate-lanceolate, acuminate, glabrous;

Corolla: 5 to 6 lin. in diameter, rotate, without a distinct tube, glabrous and smooth outside, finely to very minutely puberulous all over the inner surface, entirely dark purple-brown, or with the part around the corona yellow or orange nearly up to the sinuses (*Marloth*); united part flat-tish or saucer-shaped; *lobes* spreading or ascending-spreading, with recurved tips, $1\frac{3}{4}$ to 2 lin. long, $1\frac{1}{2}$ to 2 lin. broad at the base, deltoid-ovate, acuminate;

Outer corona: arising near the base of the staminal column and attaining to about the same level, forming 5 very short entire or notched pouches alternating with the anthers and rising into 5 erect subquadrate or subquadrate-ovate lobes behind the inner corona-lobes, obtusely 3-toothed at the top, with the middle tooth inflexed upon and adnate to the base of the inner corona-lobes;

Inner corona: lobes $\frac{1}{6}$ to $\frac{1}{4}$ lin. long, linear-oblong, obtuse, incumbent upon the backs of the anthers and about half as long as them.

Type locality: Cape Prov.: Bechuanaland: without precise locality.

Distribution: Also from Prieska Distr.: near Prieska; Griqualand West: Hay Distr. Asbestos Mountains, etc.; Herbert Distr.: Douglas; South West Africa: Bethany.

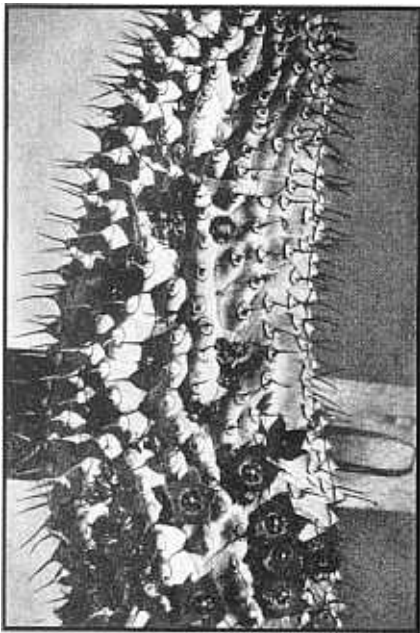


FIG. 1081

Trichocaulon officinale N. E. Brown x 1.

Photo by Prof. Dinter in Neue Pfl.
D. S.-W. Afr., 1914.

The name, *T. officinale*, means the "medicinal *Trichocaulon*," from the Latin word "officina," a medical laboratory or other kind of work-shop, and it refers to the unusual history of the plant. In the late 80's of the last century some transverse slices of the stems with flowers attached, dried and threaded on strings, found their way to America from some part of Bechuanaland as a South African cure-all. They were forwarded to the British Pharmaceutical Society for laboratory investigation and E. M. Holmes, of the Society, passed them on to the Kew Herbarium in 1889, where they came into the hands of N. E. Brown, who published a description of them in 1895. Later the species was collected by Dr. Marloth in Griqualand West and again just south of the Orange River near Prieska, and it has also been found in South West Africa. The general appearance of the plant is similar to that of *Trichocaulon piliferum*, but smaller, the stems up to 5

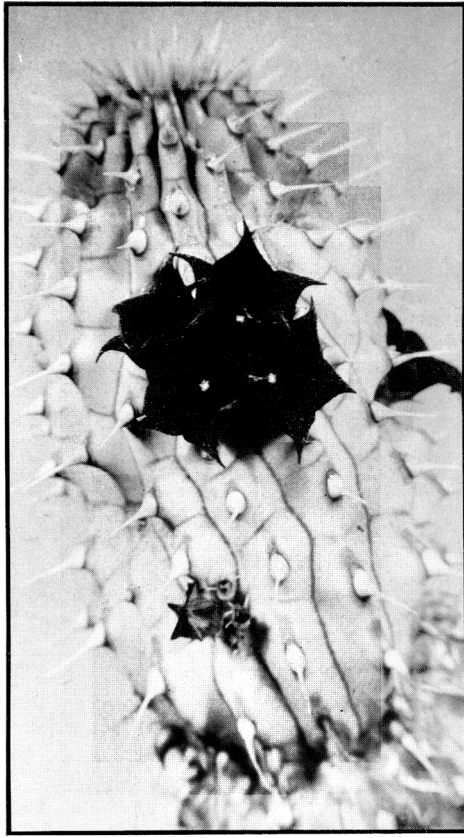


FIG. 1082

Trichocaulon officinale N. E. Brown x 1.75

inches high and with fewer rows of bristle-tipped tubercles. The $\frac{1}{2}$ -inch flowers are either wholly dark purple-brown or else they have the corolla-disk around the corona in contrasting yellow or orange. They have no distinct central tube, the corolla-disk being flat or saucer-shaped. In the flowers from Bechuanaland and Griqualand West, the outer corona appears to

be orange and quite glabrous, while the specimen from Prieska has the outer corona minutely puberulous on the back and according to a colored drawing it is purplish. The outer corona-lobes are pouch-like at the base and 3-toothed at the top, the middle tooth intergrown with the base of the inner corona-lobes.

11. *Trichocaulon pubiflorum* Dinter, Fedde: Repertorium, xxx. 192. 1932.

(Description by Prof. K. Dinter, l.c., translated from the German):

Plant: (up to date) 13 cm. high, composed of several uniform stems, without branches; *stems* about 4 cm. thick, dark blue-green, with 14 very regular rows of tubercles, 6 mm. broad at the base of the stems, tipped with spiny bristles 4 mm. long, and 4 mm. apart on the rows;

Flowers: in clusters of 3 to 5 from the grooves between the tubercles;

*Pedice*l: about 11½ mm. long and about as thick;

Sepals: 2 mm. long, acuminate;

Corolla: in bud flat; when expanded 11 mm. in diameter, flatly saucer-shaped, with fine hairs on the inner face almost to the centre; *lobes* 4 mm. long, 5 mm. broad at their base, acuminate; united portion of the corolla yellow-green on the outside, lobes red-brown; within the centre of the corolla is yellow, then follows a yellow zone with red dots, passing into the olive-brown-green color of the lobes, which are margined in violet-brown;

Corona: 2 mm. in diameter and as much in height;

Outer corona: deeply bowl-shaped, with 5 broad lobes bifid to half-way down, minutely hairy outside, each lobe produced in the middle into an obtuse rounded projection which is curved inwards and lies against the inner corona-lobes; greenish-yellow, the 10 teeth brown;

Inner corona: lobes ribbon-like, rounded, brown.

Type locality: South West Africa: Great Namaqualand: near Vellor, east of Warmbad.

Distribution: Not further known.

The "downy-flowered *Trichocaulon*" is a near relative of *Trichocaulon officinale*, from which it differs in the longer and denser pubescence of the inner corolla surface and in the outer face of the outer corona being also pubescent. It was discovered by Prof. Dinter in Great Namaqualand on March 29, 1924, while making a midday stop near Vellor on the way from Warmbad to Udabis. It is a rare species, the 6-inch stems with 14 rows of bristle-tipped tubercles. The flowers are yellow at the base of the corolla inside, changing to yellow with red dots, while the lobes are olive-brown-green with an edging of violet-brown. The corona form is very closely similar to that of *T. officinale*.



FIG. 1083

Trichocaulon pubiflorum Dinter x 0.8

Photo by Prof. Dinter, from a plant from
Vellor-Udabis, Great Namaqualand.

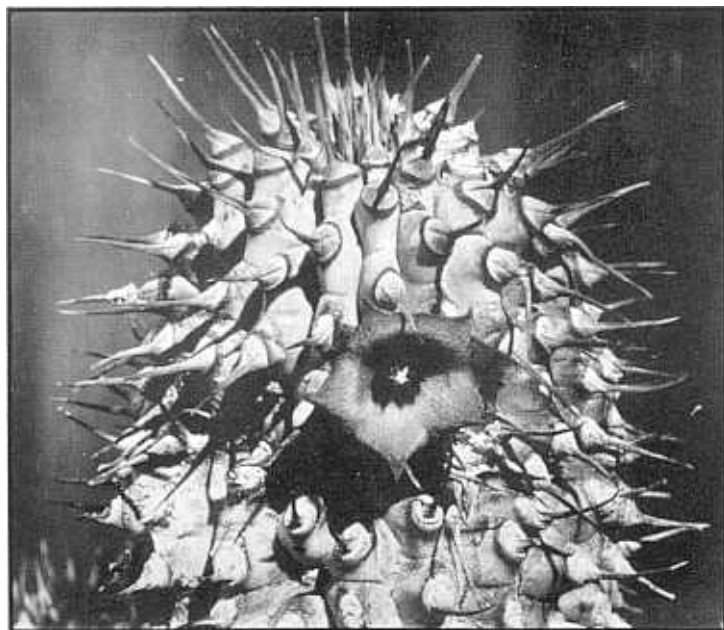


FIG. 1084

Trichocaulon delaetianum Dinter x 2.

Photo by Carl Luckhoff.

12. *Trichocaulon delaetianum* Dinter, Fedde: Repertorium, xix. 155. 1923.

(Description by Prof. K. Dinter, l.c., translated from the German):

Plant: consisting of 2 to 20 stems; *stems* 10 to 20 cm. high, 4 to 5 cm. thick, with numerous rows of tubercles, tipped with slender purple-brown pointed bristles;

Flowers: 3 to 4 together, developed successively;

Pedicel: 1 to 2 mm. long;

Sepals: $1\frac{1}{4}$ mm. long, acuminate;

Corolla: 12 mm. in diameter, the outside measurement from the tip of a lobe to the bottom 8 to 9 mm., from the sinuses to the bottom 6 mm., broadly campanulate, outside brown-red, inside brownish-yellow, without papillae even at the base; *lobes* acuminate;

Corona: saucer-shaped, dark cherry-red, without spots;

Outer corona: of 5 lobes, each with 3 obtuse tips, the middle one curved forward behind the corresponding inner corona-lobe;

Inner corona: lobes short, tongue-shaped, rounded at the apex, leaving the anthers free.

Type locality: South West Africa: Great Namaqualand: Klinghardt Mountains.

Distribution: Not further known.

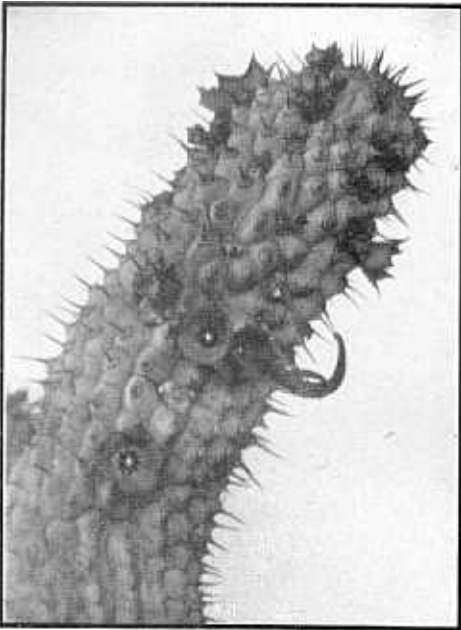


FIG. 1085

Trichocaulon delaetianum Dinter x 1Photo by Prof. Dinter in Neue Pfl.
D. S.-W. Afr., 1914.

Discovered by Prof. Dinter in the Klinghardt Mountains of Great Namaqualand in September, 1922, and named by him after the Belgian expert and dealer in succulents, Fr. de Laet. The species is quite tall, the stems sometimes 8 inches high, with purple-brown bristles at the tips of the tubercles. The flowers were once compared by Prof. Dinter to "miniature *Hoodia*

flowers, outside red-brown, inside waxy-yellow." They are broadly bell-shaped, with no distinct central tube and without a trace of papillae. The outer corona-lobes are trifid, with the middle tooth bending forward behind the corresponding lobe of the inner corona.

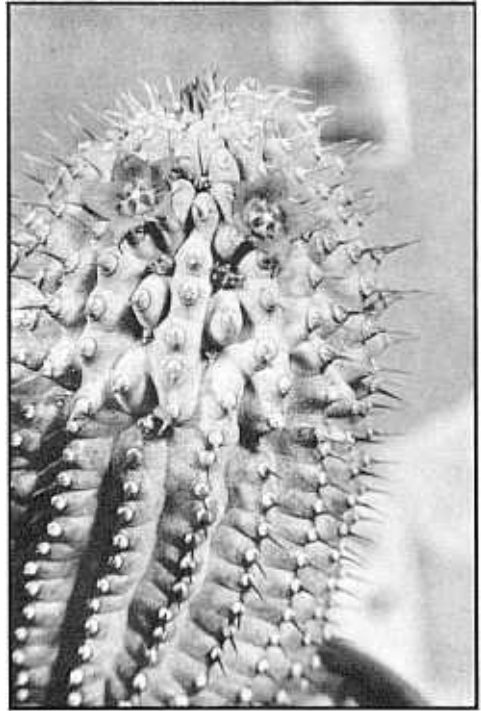


FIG. 1086

Trichocaulon delaetianum Dinter x 1.25

13. *Trichocaulon flavum* N. E. Brown, Journ. Linn. Soc., xvii. 165. 1878.

(Description by Dr. Brown, Flora Cap., iv. i. 893):

Plant: about 6 in. high, with stems just like those of *T. piliferum* in size and other characters, but the slender spines terminating the tubercles are of a darker brown;

*Pedice*l: $\frac{1}{2}$ to $\frac{3}{4}$ lin. long, glabrous;

Sepals: 1 to $1\frac{1}{4}$ lin. long, tapering from the $\frac{1}{2}$ -lin. broad base to the very acute apex, glabrous;

Corolla: about $\frac{1}{2}$ in. in diameter, lobed to half-way down, glabrous on both sides and not ciliate, smooth outside, minutely papillate or smooth on the inner face, dull yellow; *tube* none, the united part flat; *lobes* ascending-spreading, with recurved tips, about 2 lin. long and $2\frac{1}{2}$ lin. broad at the base, broadly deltoid-ovate, rather abruptly or shortly subcuspidate-acuminate;

Outer corona: lobes 1 lin. long, very spreading or slightly recurving, shortly connate at the base, deeply divided into 2 linear diverging segments, which approach those of the adjacent lobes, forming pairs of teeth somewhat resembling the mandibles of a beetle, yellow, glabrous;

Inner corona: lobes scarcely $\frac{1}{2}$ lin. long, linear, obtuse, closely incumbent upon the backs of the anthers and not exceeding them, dorsally adnate at the base to the outer corona, yellow, glabrous.

Type locality: Cape Prov.: Karroo, without precise locality.

Distribution: Beaufort West Distr.: Rhenoster Kop; Prince Albert Distr.: near Prince Albert; Kenhardt Distr.: Theronville.

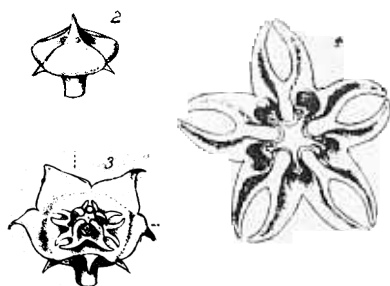


FIG. 1087

Trichocaulon flavum N. E. Brown (3) x 1.5

From Journal of the Linnean Society, 1878.

The "yellow *Trichocaulon*" much resembles *Trichocaulon piliferum* in general habit, save that the spines on the stem tubercles are darker brown. The flowers are readily distinguished in that they are smaller, yellow, and have the corolla disk quite flat, with no trace of a central tube. Those of the type specimen, discovered by Thomas C. Bain in the Karroo about 1875, are minutely papillate on the inner surface, while those more recently collected in Beaufort West and Prince Albert districts have the inner surface entirely smooth. The outer corona-lobes are bifid, the somewhat scythe-shaped segments curving sideways

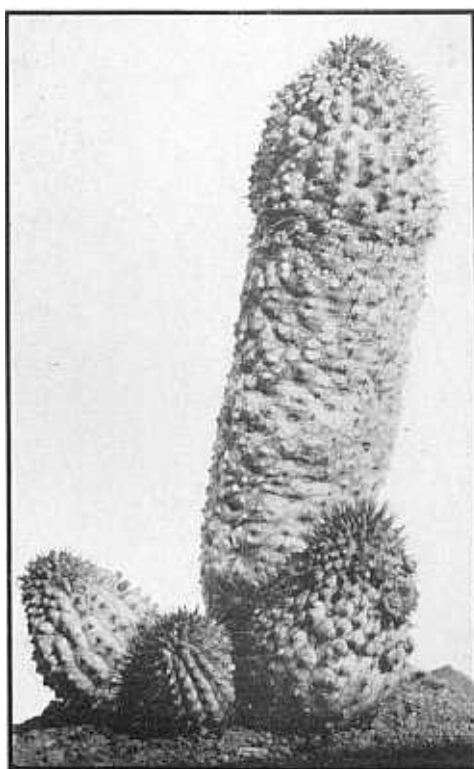


FIG. 1088

Trichocaulon flavum N. E. Brown x 0.75

From the collection of David Pringle.

so as to form with neighboring segments from adjoining lobes five pairs of "mandibles," a style of architecture present in *T. cactiforme* and several other species of *Cactoideas*. Mrs. van der Bijl tells of an old man who would say of *T. flavum*: "Yes,

that'n guaap! Cut a small piece, chew it—and *then* smoke a pipe!" One must leave to the imagination the particular tang imparted to the tobacco. Those fond of alliteration would doubtless call it the "flavum flavor."



FIG. 1089

Trichocaulon flavum N. E.

Brown x 2.

From the collection of Harry Tate. This photograph shows the resemblance which the two adjoining segments of two outer corona-lobes bear to the "mandibles of a beetle."

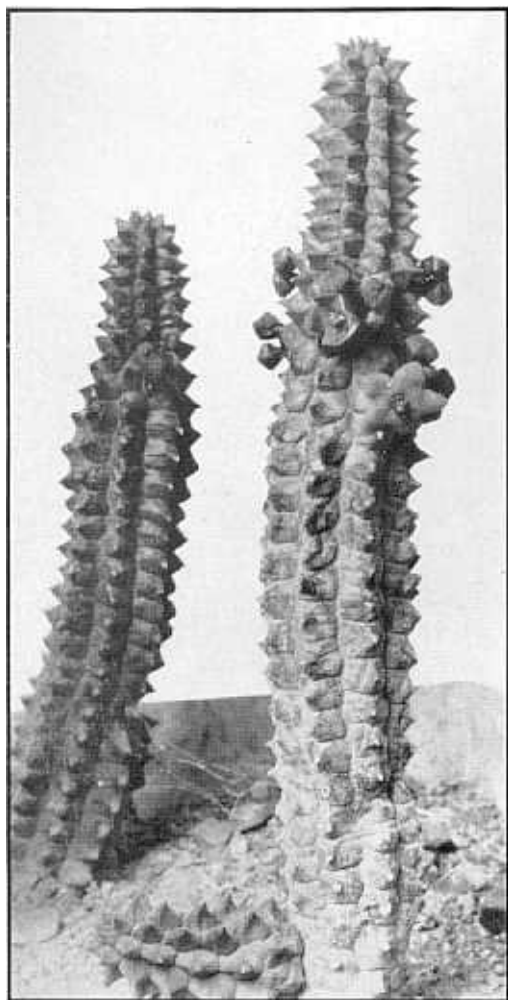


FIG. 1090

Trichocaulon columnare Nel x 1.

Photo by H. Herre, Kakteenkunde, 1933

14. *Trichocaulon columnare* Nel, Kakteenkunde, 135. 1933.

(Description based on that by Prof. G. C. Nel, l.c., translated from the German):

Stems: 15 to 18 cm. high, 2 to 2½ cm. thick, greyish-green, glabrous, columnar, cylindrical, but sometimes narrowed both near the base and near the apex, 8-angled with the angles merging to fewer at the base of the older stems, the angles 1 cm. broad near the base, 5 to 7 mm. broad above, tuberculate; the tubercles separated by impressed transverse lines, stout, conical, ending in a small acute tip, which is horizontal or bent downwards, whitish at the base of the tips;

Flowers: in fascicles of 10 to 15 on the upper half of the stems arising from the grooves between the angles;

Pedicel: 2 to 4 mm. long, with a few small dots;

Sepals: 2 mm. long, ovate at the base, then subulate-acuminate, glabrous, with small dots and red margins;

Corolla: in bud conical, almost truncate at the apex, baggy at the corners, 4 to 8 mm. in diameter; when expanded rotate-campanulate, outside dotted with many small purple-red spots, sparsely pubescent near the base, inside yellowish-green, with purple to red spots; *tube* about 2 mm. long; *lobes* 2 mm. long, 4 mm. broad, ovate-acute, covered on the inner surface with short erect stiff white hairs;

Outer corona: lobes linear, minutely bifid, yellow;

Inner corona: lobes 2 mm. long, subulate-acute, yellow with purple-red dots, incumbent on the anthers, but leaving a small free open spot at the centre.

Type locality. Cape Prov.: Little Namaqualand: Richtersveld: Helskloof.

Distribution: Also from near Kubus.

The "columnar *Trichocaulon*," so named because of its erect, slender stems, was discovered by H. Herre in the northerly portion of Little Namaqualand in September, 1929. It is a unique intermediate species,

which we have assigned in solitary state to a new section, *Tricholuma*. The stems are suggestive of some *Carallumas*, such as *C. armata*, by reason of the stout conical teeth, as well as the habit of growth. The height

of the stems varies from 6 to 8 inches up to nearly 2 feet, and they are erect or prostrate, branching freely both at the base and high up the stems. The division of the angles into regular tubercles, classifies the plant more properly as a *Trichocaulon*; and the regular alignment of the angles, the lack of the juicy stem-sap associated with the *Cactoideas* and the distribution of the flowers all over the upper half of the stems, would all combine to place it among the *Eutrichocaulons*, were it not that the tubercles bear no actual terminal bristles or spines. The flowers grow in clusters of 10 to 15, developing in succession, and they are quite tiny, under $\frac{1}{4}$ inch in diameter, yellow-green inside with purple-red spots, and minutely hairy. The outer corona is yellow, the lobes very shortly bifid; the inner corona is yellow with purple-red spots, the tips incumbent over the anthers, but not quite meeting. In the flower shown in Fig. 1091, we found the purplish spots on the outer corona-lobes also.

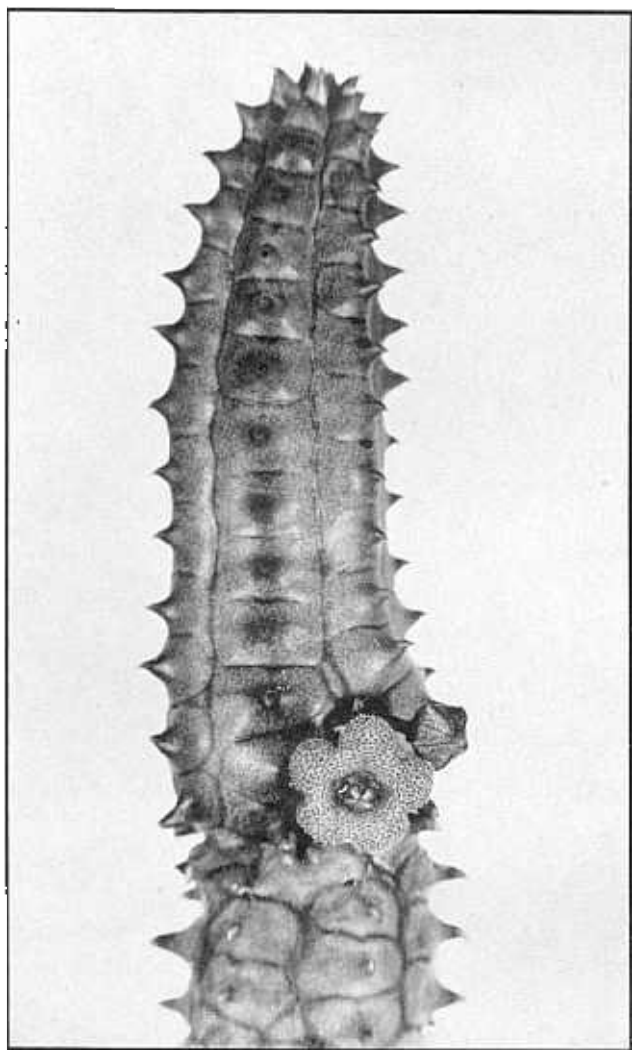


FIG. 1091

Trichocaulon columnare Nel x 1.75

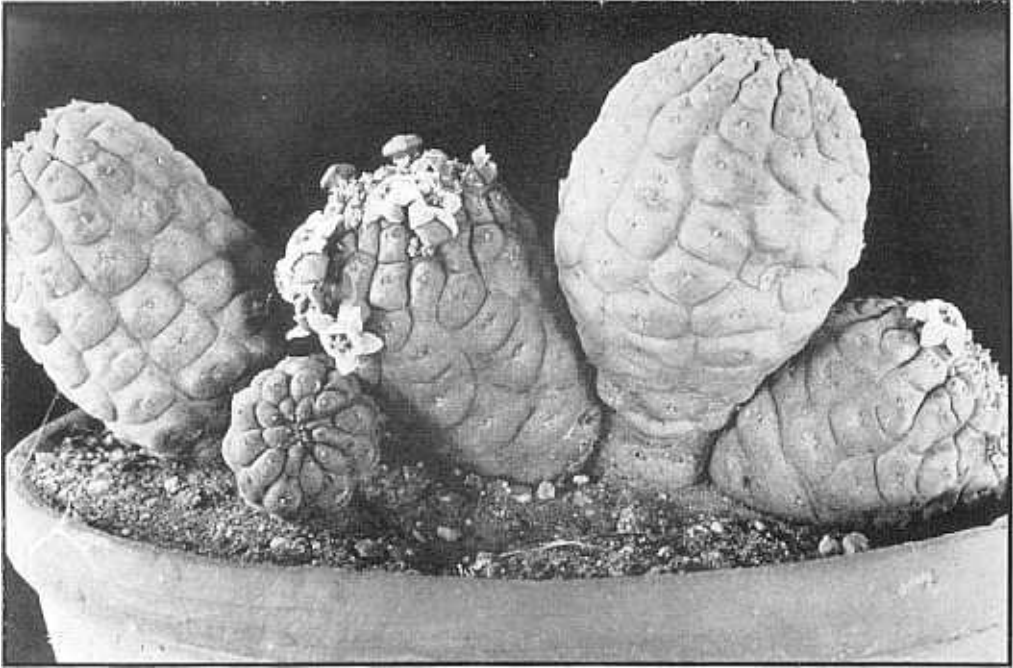


FIG. 1092

Trichocaulon kubusense Nel x 1.

Photo by H. Herre, Kakteenkunde, 1933.

15. *Trichocaulon kubusense* Nel, Kakteenkunde, 70. 1933.

Trichocaulon kubusanum Nel, ex Jacobsen: Succulent Plants, 291. 1935.

(Description based on that by Prof. G. C. Nel., l.c., translated from the German) :

Stems: clavate, 16 cm. high, about 4 cm. thick, the basal half 16-angled (the angles formed of tubercles which are prominent near the base and more smooth above), the upper half covered with flat tubercles irregularly disposed; tubercles greenish, spineless and glabrous;

Flowers: in fascicles of 10 to 12 arising from the grooves between the tubercles on the upper quarter of the stem;

Pedicel: 2 mm. long, glabrous;

Sepals: 1 mm. long, $\frac{1}{2}$ mm. broad, broadly ovate at the base, acute;

Corolla: in bud 4 mm. broad, flatly truncate; when expanded rotate-campanulate, 1 cm. in diameter, glabrous outside, lobed almost to half-way down; *annulus* 4 mm. in diameter, sharply raised around the corona; *lobes* 3 mm. long, $2\frac{1}{2}$ mm. broad, with many conical papillae on their inner surface, irregularly marked at the base with brown-red spots, uniformly greenish-white at the tips;

Outer corona: lobes 3-toothed, the lateral teeth 1 mm. long, arching, the middle tooth very short;

Inner corona: lobes incumbent upon the anthers and not produced beyond them.

Type locality: Cape Prov.: Little Namaqualand: Richtersveld: Kubus.

Distribution: Also from Richtersveld: Obib Mountains, near Sendlingsdrift.

The "Kubus *Trichocaulon*" was discovered near Kubus, in the extreme north of Little Namaqualand, by H. Herre in October, 1929 (see Appendix F).

The plant consists of glabrous stems, 6 or 7 inches tall, the lower half divided into about 16 distinct tuberculate angles, the upper half irregularly tuberculate. The flowers form in clusters on the top quarter of the stem. They occupy the same position among the *Cactoideas* that *Trichocaulon annulatum* does among the *Eutrichocaulons*, for the corolla is characterized by a prominent raised annulus around the corona.

The outer corona-lobes are 3-toothed,

and the corona as a whole belongs in the tradition of *T. simile*. Of the existence of hybrids of this species, our collaborator, H. Herre, writes us: "The fertilization of *Stapeliads* is so complicated that hybridization does not occur freely among all the species. However, I have found many hybrids among the spineless-stemmed *Trichocaulons*. There is, for instance, a constant type form of *T. kubusense*, and between this and one of its neighbors, still unnamed, I have seen all sorts of transitions in the color and form of the flowers, which could only have been brought about by hybridization."

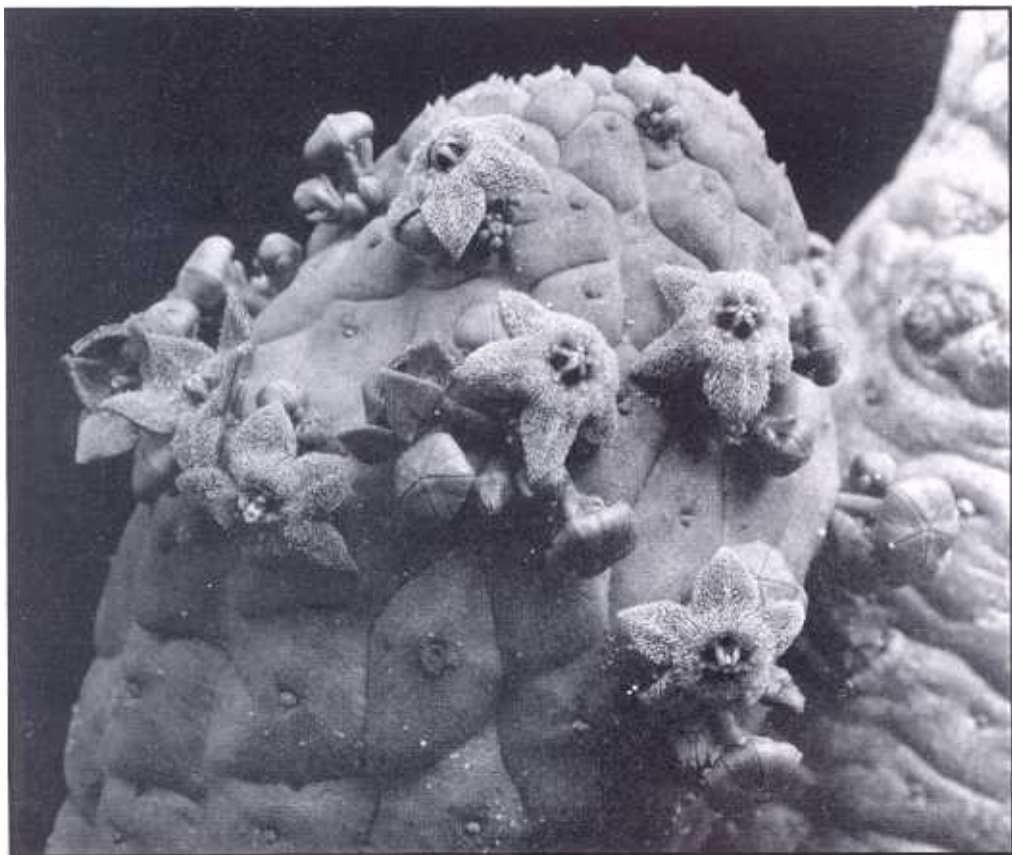


FIG. 1093

Trichocaulon kubusense Nel x 2.5

Photo by Carl Luckhoff.

16. *Trichocaulon perlatum* Dinter, Fedde: Repertorium, xix. 155. 1923.

(Description based on that by Prof. K. Dinter, l.c., translated from the German) :

Stems: several, to 15 cm. high and 5 cm. thick, bright grey-green;*Flowers*: in fascicles of 2 to 4 from the apex of the stems, subsessile, developed successively;*Sepals*: $\frac{3}{4}$ mm. long, ovate, almost obtuse, glabrous, green;*Corolla*: flat, 8 mm. in diameter, outside yellow-green spotted with purple, inside densely papillate, the papillae whitish, globose, not shiny; the centre of the corolla with a glabrous green saucer-shaped depression;*Outer corona*: bowl-shaped, the 5 lobes consisting each of two diverging short obtuse teeth, with a third simple obtuse broad tooth between them; waxy yellow margined with red, with a few irregular red spots;*Inner corona*: lobes situated respectively in front of the 5 middle teeth of the outer corona-lobes, short, broad, emarginate at the tips, incumbent upon the anthers; color same as that of the outer corona.

Type locality: South West Africa: Great Namaqualand: Klinghardt Mountains.

Distribution: Not further known.

Discovered by Prof. Dinter, together with *Trichocaulon delaetianum*, in the Klinghardt range of Great Namaqualand in September, 1922. It is a tall species, as compared with most other *Cactoideas*, the stems up to 6 inches high, with the flowers growing from their obtuse apex. The corolla is flattish, with a shallow depression at the centre which is raised at its edge into a low annulus, less distinct than that of *T. kubusense*. The relation of the annulus in the two species corresponds approximately to that between *T. piliferum* and *T. annulatum*. The inner surface of *T. perlatum* is densely covered with rounded whitish papillae, whence the name, the "pearly *Trichocaulon*." The outer corona is bowl-shaped, the edge of the bowl produced into 5 trifid lobes, the lateral teeth of each lobe diverging and the middle tooth standing directly behind the corresponding inner corona-lobe.

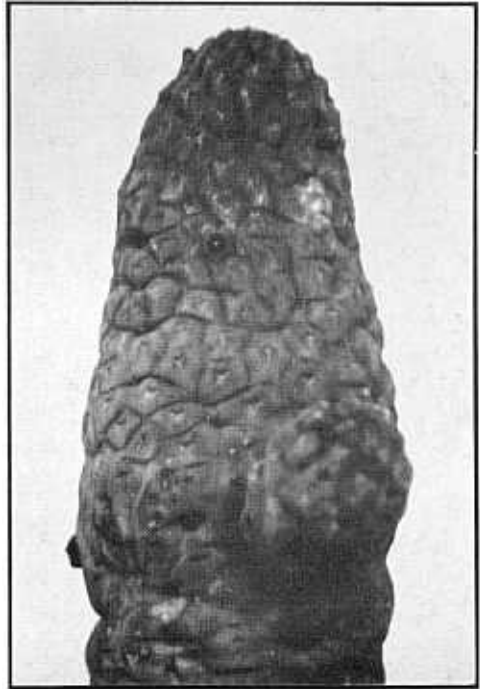


FIG. 1094

Trichocaulon perlatum Dinter. x 1.

From a photo by Prof. Dinter of a plant from the centre of the Klinghardt Mountains; Great Namaqualand.

17. *Trichocaulon cinereum* Pillans, So. Afr. Gard., xviii. 62. (Special reprint). 1928.

(Description by N. S. Pillans, Lc., translated from the Latin) :

Plant: 10 to 15 cm. high, divided at the base into 2 to 5 ascending ovoid or cylindrical-ovoid very obtuse *stems*, 4 to 5½ cm. in diameter, glabrous, glaucous-green, covered with tubercles arranged tessellately, slightly prominent, obtuse, spineless, bearing when young short broadly ovate acute rudimentary leaves;

Flowers: in cymes of 2 to 12, developing successively 1 to 3 at a time;

*Pedice*l: 2 mm. long, glabrous;

Sepals: ovate, acute, glabrous, minutely papillate at the margins;

Corolla: 7 to 9 mm. in diameter, outside glabrous, spotted subpurple; *lobes* spreading or reflexed, deltoid-ovate, acute, 2 to 2½ mm. long, more or less convex above, very pale green, densely covered with small cylindrical whitish papillae, so that the flowers are ashy-colored; *disk* slightly raised, very pale green, covered with whitish papillae, reaching beyond the mouth of the tube; *tube* campanulate, 1½ mm. long, glabrous below the mouth, pale green spotted with purple, wholly closed by the corona which slightly overtops the disk;

Outer corona: shortly cup-shaped at the base; lobes erect-spreading, about ½ mm. long, divided almost to the base into 2 linear-falcate diverging segments, yellow spotted with red;

Inner corona: lobes 1 mm. long, broadly oblong, truncate, emarginate, yellow spotted with red, incumbent on the anthers and slightly exceeding them, dorsally adnate at the base to the outer corona and there produced into 2 or 3 small teeth or a short segment widened at the base.

Type locality: Cape Prov.: Little Namaqualand: Richtersveld.

Distribution: Not further known.

The "ashen-grey *Trichocaulon*" derives its name from the color of the inner corolla surface of its flowers, which readily distinguishes it from all other *Trichocaulons*. The ground color is pale green, but it is so densely covered with small cylindrical whitish papillae as to appear uniformly ashy-grey. This papillate effect should be compared with that of *Trichocaulon perlatum*, where the dense small globose whitish papillae produce an equally characteristic "pearly" impression. *T. cinereum* was discovered by Mr. Pillans in the northern section of Little Namaqualand in 1926.

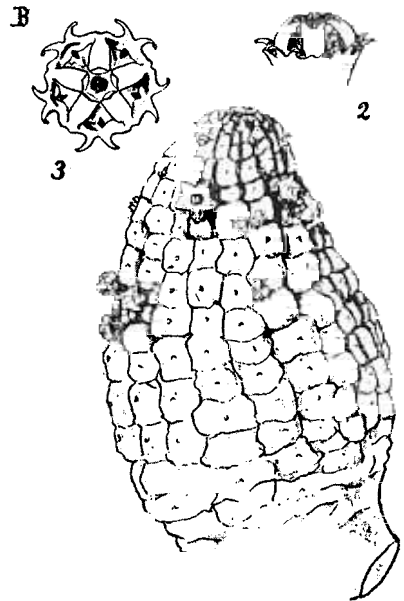


FIG. 1095

Trichocaulon cinereum Pillans x 0.75

From a drawing by L. Guthrie in South African Gardening and Country Life, 1928.

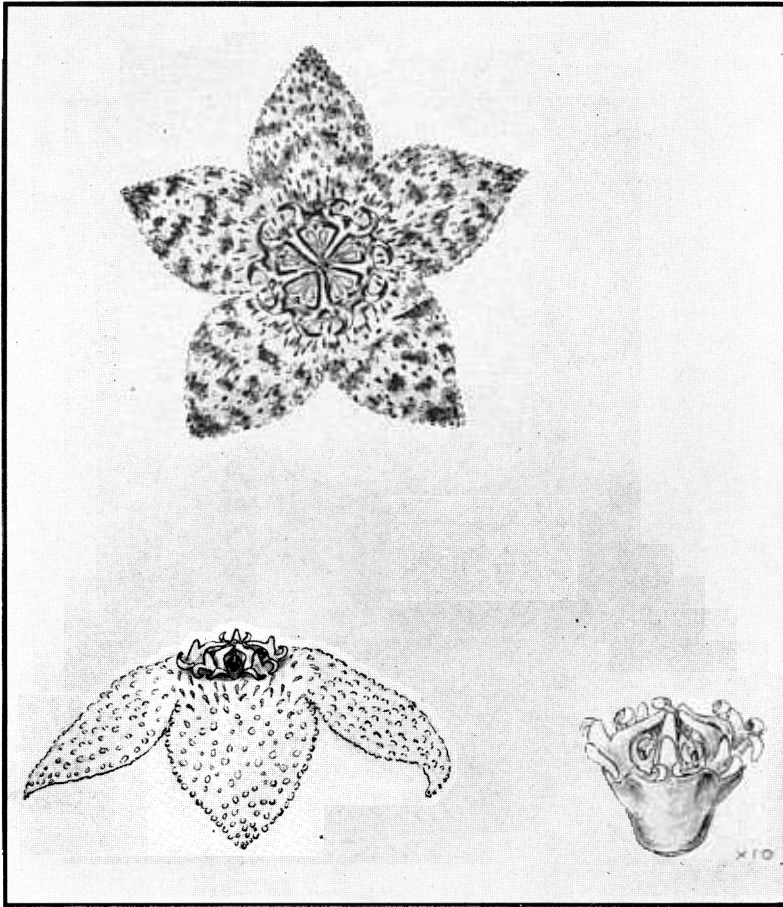


FIG. 1096

Trichocaulon truncatum Pillans x 8.

Drawing by Miss G. J. Lewis of the type flower.

***Trichocaulon truncatum* Pillans, sp. nov.**

(Description by N. S. Pillans):

Caules glabrae, tuberculis truncatis leviter prominentibus. Corolla supra papillis parvis, albidula, maculis purpureis tecta. Corona exterior lobis profunde bipartitis, segmentis linearis, valde arcuato-divergentibus. Corona interior lobis lineari-oblongis, in antheris incumbentibus et eas leviter superantibus, dorsaliter basi breviter dentatis.

Plant: about 10 cm. high, branched at base; *stems* cylindric or subclavate, 3.5 to 4 cm. thick, irregularly tuberculate, grey-green; tubercles pentagonal, slightly prominent, truncate, somewhat depressed in the centre;

Flowers: around the summit of the stems, subsessile;

Sepals: 1 mm. long, ovate, acute;

Corolla: 8 mm. in diameter, cream on the inner surface, mottled with purple; *tube* 1.5 mm. deep, pentagonal within; *disk* very slightly raised, covered with minute elongated papillae; *lobes* 2.5 to 3 mm. long, spreading and slightly recurved, flattened across, ovate, acute, covered with rotundate papillae;

Outer corona: lobes 1 mm. long, divided to the middle into two diverging subulate segments, whitish, spotted and striped with purple;

Inner corona: lobes linear-oblong, obtuse, with the tips meeting and shortly erect, whitish, purple on the margins, with a short purple tooth at the base of the dorsal surface.

Type locality: Cape Prov.: Little Namaqualand: Ouranoop, north of Steinkopf.

Distribution: Not further known.

The "truncate *Trichocaulon*" was discovered by Ray H. N. Smithers, an enthusiastic collector of Wynberg, C.P., during an exploring trip to the Richtersveld in September, 1935. The type is No. 21725 in the Bolus Herbarium. "I found the plant," says Mr. Smithers, "near one of the few patches of *Pachypodium namaquanum* in existence, east of the road between Steinkopf and Viols Drift." "The species has affinities," according to Mr. Pillans, "with *T. cinereum*, but is distinguished by the flattened tubercles on the stems, by its smaller, more conspicuously marked corolla and by its less prominent disk." We regret that the species was received too late for inclusion in the Key.

18. *Trichocaulon sinus-lüderitzii* Dinter, Neue Pfl. Deutsch-Südwest-Afr., 59. 1914.

(Description by Prof. K. Dinter, l.c., translated from the German):

Stems: up to 8 cm. long and up to 4 cm. thick, grey-green, with tiny acute leaves;*Flowers*: in groups of 4 to 6 from the grooves on the upper half of the stems;*Pedicel*: about 1 mm. long;*Corolla*: in bud flat; when expanded campanulate, with the lobes directed upwards, glabrous outside and inside, yellow-green with faint narrow reddish concentric spots;*Outer corona*: of 10 bow-shaped "Mandibles," each pair of which converge and touch at the tips and have at their base a tiny triangular tooth $\frac{1}{3}$ mm. long;*Inner corona*: lobes incumbent upon the anthers, with a long dorsal horn diverging outwards.

Type locality: South West Africa: northerly from Lüderitz Bay.

Distribution: Not further known.

The "Lüderitz Bay *Trichocaulon*" has stems to 3 inches high, with the tubercles tipped with tiny leaves. The flowers are most inconspicuous, and even when fully developed appear to be only half open, the corolla-lobes remaining erect and not spreading out as in other species. The corolla is bell-shaped, yellow-green with small red spots, wholly glabrous and presumably without papillae. The outer corona-lobes are trifid, consisting of two mandible-like segments with a minute tooth in between. The inner corona-lobes are characterized by a long dorsal projecting horn. The plant was first collected by Prof. Dinter in June, 1897, on coastal rocks near Lüderitz Bay. This town is the centre of

the diamond fields in South West Africa. It has a well-sheltered harbor and is the seaboard terminus of the railway to Keetmanshoop. But with these advantages it is handicapped by the lack of rainfall, which averages less than $\frac{2}{3}$ of an inch per year, and by the fact that water must be brought a distance of 65 miles or condensed. It is a wonder that *Trichocaulon sinus-lüderitzii*, or any plants, can endure such permanent drought conditions, yet Mr. Pillans has said that *Trichocaulons* in general "never grow upon flat country nor upon the eastern side of a hill, but *always* on the upper western slope of a fair-sized hill or range of hills, and then they pick out the driest spot where most shale and least soil is to be found."

19. *Trichocaulon cactiforme* (Hooker) N. E. Brown, Icon. Pl., sub t. 1905, false *cactiformis*. 1890.

?*Stapelia* sp. Paterson, Narrative, 60. 1789.

?*Stapelia clavata* Willdenow, Sp. Pl. i. 1295. 1797.

Stapelia cactiformis Hooker, Bot. Mag., t. 4127. 1844.

(Description by Dr. Brown, Flora Cap., iv. i. 895):

Plant: 2 to 4 in. high, simple or branching at the base into 2 to 5 cylindric or clavate stems $1\frac{1}{2}$ to 2 in. thick, covered with crowded slightly prominent obtusely rounded pointless tubercles, glabrous, whitish-green, flowering at the very obtuse apex;

*Pedice*l: $\frac{1}{2}$ lin. long, glabrous;

Sepals: $\frac{3}{4}$ lin. long, ovate, acute, glabrous;

Corolla: $\frac{1}{3}$ in. or more in diameter, glabrous outside and within, not ciliate, papillate rugulose on the inner surface, pale yellow spotted with blood-red; *tube* distinct, shallowly cup-shaped; *lobes* spreading, about $1\frac{1}{2}$ lin. long and as much or more in breadth at the base, very broadly ovate or deltoid-ovate, abruptly and shortly acuminate;

Outer corona: lobes ascending-spreading, $\frac{2}{5}$ lin. long, divided nearly to the base into 2 linear-falcate widely diverging segments which form mandible-like pairs of teeth with those of the adjacent lobes behind the inner corona-lobes, yellow, dotted with blood-red;

Inner corona: lobes $\frac{1}{4}$ lin. long, linear, obtuse, closely incumbent upon the backs of the anthers and not produced beyond them, dorsally connected at the base to the outer corona and there produced into a short suberect tooth;

Follicles: diverging, slightly incurved, $1\frac{3}{4}$ to 2 in. long, 3 to $3\frac{1}{2}$ lin. thick, terete-fusiform, acute, glabrous.

Type locality: Cape Prov.: Little Namaqualand: without precise locality.

Distribution: Widely distributed in Little Namaqualand: near O'okiep; between Koperberg and Kokfontein; etc.; also in Richtersveld: Sendlingsdrift, Arrisdrift, etc.; and in Little Bushmanland: Gezelschaps Bank (?); Griqualand West: Douglas; Mazelsfontein; South West Africa: Arasab River, south of Kubub.

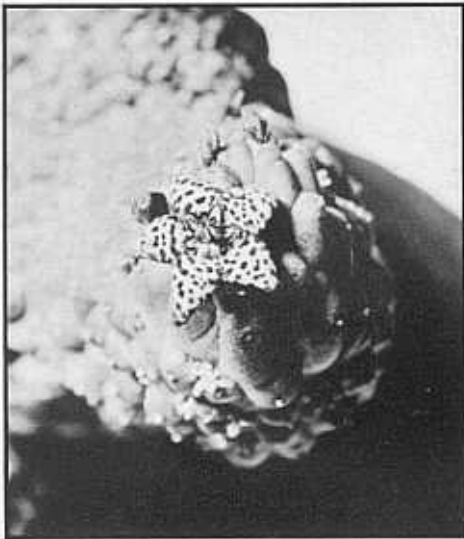


FIG. 1097

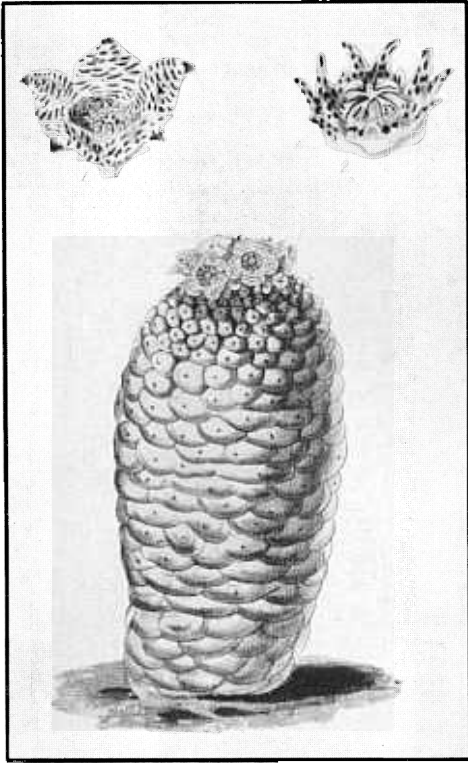
Trichocaulon cactiforme N. E. Brown x 2.

The "cactus-shaped *Trichocaulon*" was collected by Carl Zeyher in Little Namaqualand, probably near the Orange River, about 1840. It flowered for the first time in England in August, 1844, and was then christened by Sir William J. Hooker, "*Stapelia cactiformis*," the name being later recombined as *Trichocaulon cactiforme* by Dr. N. E. Brown. It is probably the same plant which Capt. William Paterson discovered in Little Bushmanland in 1778 or 1779, of which he figured a fruiting stem in his Narrative of Four Journeys, 1789, (see Fig. 1). In 1797 Paterson's plant was christened *Stapelia clavata* by Willdenow, who termed it a "doubtful species" and merely described it as having a "single thick stem with a network of faint tubercles, bearing fruit at the top." As long as

Trichocaulon cactiforme remained the only known species of spineless-stemmed *Trichocaulons*, its identity with Paterson's plant was assumed and so late as 1909 Dr. Brown cited Willdenow's name, *Stapelia clavata*, as an undisputed synonym of *Trichocaulon cactiforme*. Were the identity really established, Willdenow's name must

have taken precedence over Hooker's and the species would to-day be known only as *Trichocaulon clavatum* (Willdenow). But with the discovery of additional new *Cactoideas*, beginning about 1900, increasing doubt as to Paterson's plant has become possible and we realize that it might theoretically be any one of a dozen species. Paterson's figure is inadequate and Willdenow's name must go down the years as an unattached ghost in the family album of the STAPELIEAE.

T. cactiforme does not closely resemble any kind of a cactus; yet from the pleasant cadence of its name or perhaps from the faint reminiscence its frequently solitary globose stems arouse of the crude cactoid drawings in old periodicals, the association of the entire section of spineless-stemmed *Trichocaulons*, which we call the *Cactoideas*, to the cacti, has continued. As in most of the *Cactoideas*, the flowers of *T. cactiforme* are borne at the obtuse apex of the stems, contrasting with the more generally distributed inflorescence of the *Eutrichocaulons*. The color of these small papillate flowers is a pale shade of yellow spotted with blood-red. The corona is set in a distinct cup-shaped tube at the centre of the corolla. The outer corona-lobes are deeply cleft into two almost independent segments, which arch outwards towards their neighbors from adjoining lobes and form with them the tiny pairs of "mandibles" characteristic of so many members of the genus. The inner corona-lobes are not produced above the anthers.



Trichocaulon cactiforme N. E. Brown x

From a drawing by W. H. Fitch, in Curtis's Botanical Magazine, 1844.

20. *Trichocaulon simile* N. E. Brown, Flora Cap., iv. i. 895. 1909.

(Description based on that by Dr. Brown, l.c., and an amended description by Dr. Marloth, Flora of So. Afr., iii. 94):

Stems: resembling those of *Trichocaulon cactiforme*, oblong or globose-oblong, up to $1\frac{3}{4}$ in. high (or more?) and $1\frac{1}{2}$ in. thick; tubercles more prominent than in *T. cactiforme*, the youngest near the apex tipped with a small apiculus or bristle;

Flowers: at the apex of the stems;

Pedicel: $1\frac{1}{2}$ lin. long, glabrous;

Sepals: $\frac{1}{2}$ to $\frac{2}{3}$ lin. long and quite as broad, broadly ovate, acute, glabrous;

Corolla: $4\frac{1}{2}$ lin. in diameter, quite glabrous and not ciliate on the lobes, smooth outside, minutely papillate-rugulose on the inner face of the lobes, tube cream-colored in the lower part, the upper part and the lobes with numerous dark red spots; *tube* $1\frac{1}{3}$ lin. long, $2\frac{2}{3}$ lin. in diameter outside, cup-shaped; *lobes* spreading, $1\frac{1}{2}$ lin. long and as much in breadth, triangular in outline, acute;

Outer corona: shortly cupular at the base, thence passing into 5 deeply trifid lobes red on their inner side, the two lateral teeth of each lobe erect, the middle tooth bending inwards and arching over the corresponding inner corona-lobe, which is placed directly in front of it;

Inner corona: lobes one-half the length of the outer corona-lobes, closely pressed to the backs of the anthers and shortly exceeding them, and terminating at the apex in a globose chrome-yellow knob.

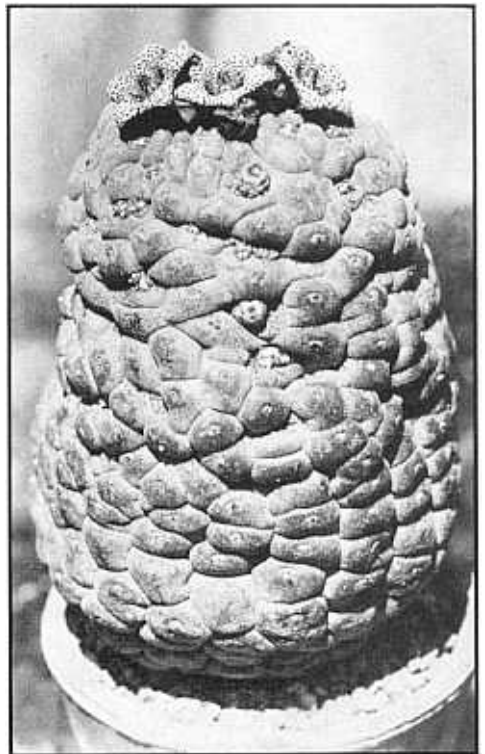
Type locality: Cape Prov.: Van Rhynsdorp Distr.: near Van Rhynsdorp.

Distribution: Also from Kenhardt Distr.: near Kakamas; near Kenhardt; Prieska Distr.: Prieska; Little Namaqualand: Richtersveld: Twee river.

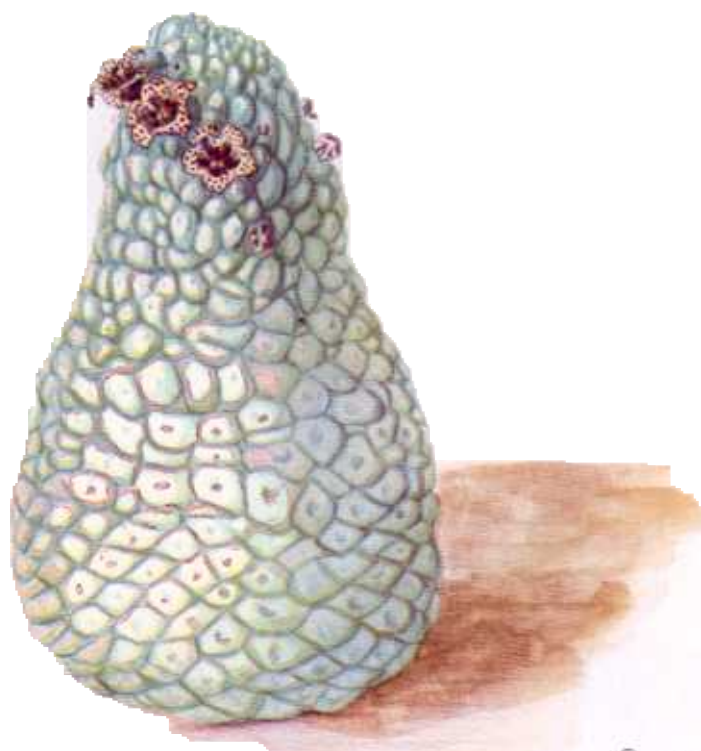
FIG. 1099

Trichocaulon simile N. E. Brown x 1.

Photo by A. Probst and E. R. Svensson.



The "similar *Trichocaulon*" is named for its resemblance to *Trichocaulon cactiforme*, but the tubercles of its stems are more prominent and the youngest ones at the apex are tipped with a tiny bristle. This is the only instance in the *Cactoidea* section where we have found mention of bristles; but "minute points" on the tubercles are spoken of in connection with *T. marlothii* and "tiny leaves" in one or two other cases. The stems would appear to be mostly solitary, although this is not specifically stated.



Cythna
Letty.

PLATE XXXIII.

Trichocaulon simile N. E. Brown

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1936.

They bear at the apex a few tiny $\frac{1}{4}$ -inch flowers, minutely papillate on the inner face, cream-colored at the base of the cup-shaped central tube and spotted dark red in the upper portion of the tube and on the lobes. The outer corona-lobes are formed of three acute teeth, the middle tooth shorter than its lateral companions and bent forward so as to arch over the corresponding inner corona-lobe, while the inner corona-lobe in its turn is closely pressed against the back of the corresponding anther, slightly exceeding it at the apex. This is a complicated pattern, which reappears with modifications in *T. kabusense*, *T.*

engleri and *T. perlatum*. An equivalent arrangement occurs also in the *Eutrichocaulon* section, in such species as *T. officinale*, *T. pubiflorum* and *T. delaetianum*. The discoverer of *T. simile* was Dr. Marloth, who first collected it about 1905 near Van Rhynsdorp in the west coast section of the Cape and later collected it again at Kakamas, just south of the Orange River near Kenhardt. Kakamas is a well-known colony maintained by the Dutch Reformed Church on the fertile banks of the Orange River, occupying an area of about 300 square miles.

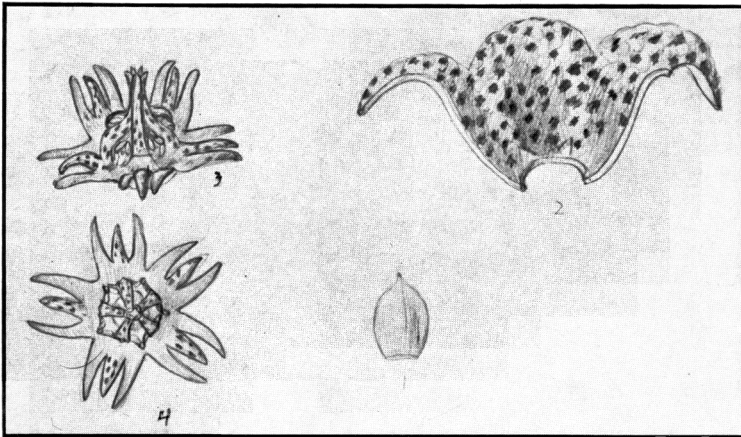


FIG. 1100

Trichocaulon simile N. E. Brown

enlargement of the corona and of a cross-section of the corolla, from draw
by Miss Cynthia Letty for the Flowering Plants of South Africa. 936.

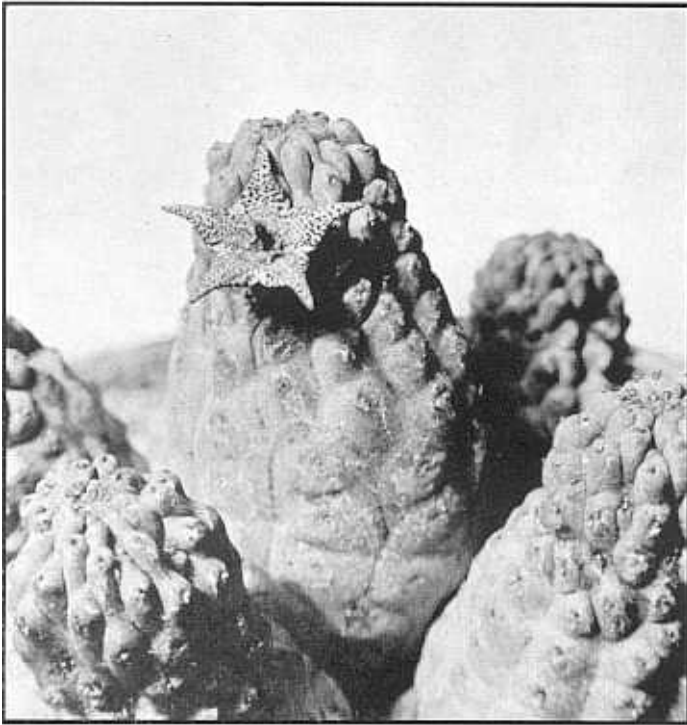


FIG. 1101

Trichocaulon dinteri Berger x 2.

From the collection of Soldena Gardens, Pasadena.

21. *Trichocaulon dinteri* Berger, Stap. und Klein., 30. 1910.

(Description by Prof. K. Dinter, Neue Pfl. Deutsch-Südwest-Afr., 55. 1914.

Translated from the German):

Stems: 1 to 6 together, 4 to 6 cm. high, 4 cm. thick, obtuse, light grey at the base, dull green above and on the younger stems, with raised 4 to 6-angled tubercles, which are divided by deep grooves; leaves present only as appressed scales $\frac{1}{2}$ to $\frac{3}{4}$ mm. long at the apex of the tubercles on the new growth;

Flowers: in fascicles of 3 to 5 from the grooves between the tubercles on the upper third of the stems, successively developed;

*Pedice*l: 1 to 2 mm. long;

Sepals: broadly ovate, obtuse, 1 mm. long and about as broad, glabrous;

Corolla: campanulate, 7 to 8 mm. in diameter, with erect lobes which are only recurved at the apex; *tube* hemispherical, glabrous inside and out; *lobes* $2\frac{1}{2}$ mm. long, 3 mm. broad; whole corolla covered outside with brown dots, both on tube and lobes; inside smooth, light colored at the base with red-brown dots and spots, which become denser and confluent on the lobes so that they appear almost uniformly dark;

Outer corona: lobes deeply bifid, forming in all 10 long narrow linear segments, which first diverge and then converge in pairs, touching at the apex, yellow with red-brown spots;

Inner corona: lobes produced above the anthers and meeting just below their tips; tips bent back and not forming an erect column; at the base with a stout prominent tooth on either side, margined with red.

Type locality: South West Africa: in the Namib, 82 kilometers east of Swakopmund.

Distribution: Not further known.

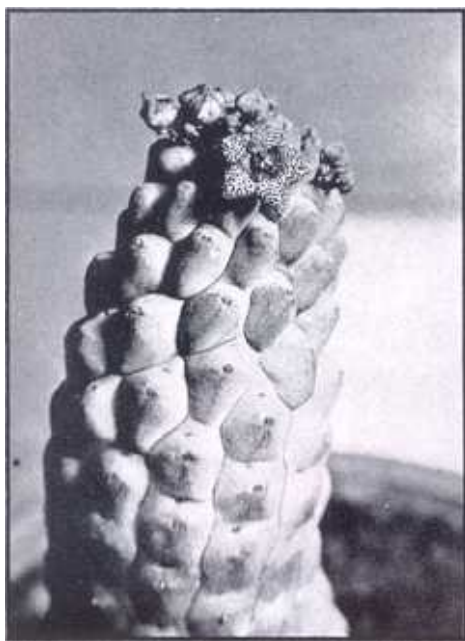


FIG. 1102

Trichocaulon dinteri Berger x 1

"Dinter's Trichocaulon" was discovered by Prof. Dinter in the Namib, about 50 miles inland from Walvis Bay, prior to 1906. Both Alwin Berger and Dr. Marloth have commented on its great similarity to *Trichocaulon marlothii*, but enough differences appear to exist between the two plants, whose habitats are about

900 miles apart, to justify their retention as separate species, at least until they have been more carefully compared. *T. dinteri* has a bell-shaped flower, contrasting with the saucer-shaped or flat flower of *T. marlothii*. The size and coloring of the corolla is about the same, those of *T. marlothii* having the lobes more uniformly dark red-brown; the coronas also are very similar, the inner corona-lobes of *T. dinteri* having a prominent tooth on either side at the base.

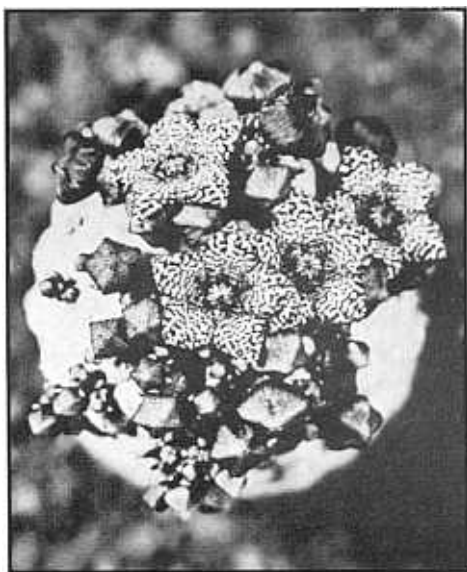


FIG. 1103

Trichocaulon dinteri Berger x 1.5

22. *Trichocaulon meloforme* Marloth, Trans. Roy. Soc. So. Afr., 239. 1912.

(Description based on that by Dr. Marloth, l.c., in part translated from the Latin):

Plant: 5 to 7½ cm. high, *stems* solitary and nearly globose, or 2 to 3 from the same root and globose-ovate; the slightly raised tubercles of the surface obtuse, without bristles, greyish-green;

Flowers: borne at the apex, 1 to 3 from the same point, opening in succession;

Pedicel: short;

Corolla: rotate-campanulate, varying in size according to the state of the plant, for in robust specimens they may be 10 mm. in diameter, while in others they are only 6 mm., dark claret outside; *tube* 2 to 3 mm. long, shallow cup-shaped, the visible portion within yellow, speckled in dark maroon; *lobes* broadly ovate, abruptly and shortly acuminate, the tips recurved when the flower has just opened, but later suberect, yellow, speckled with dark maroon on the basal portion inside, uniformly dark maroon at the tips;

Outer corona: similar to that of *Trichocaulon cactiforme*, the lobes deeply cleft into two acute widely diverging segments, each segment arching towards the nearest segment of the next adjacent lobe and with it forming a pair of "mandibles;"

Inner corona: lobes incumbent over the anthers and then elongated beyond them so as to reach the level of the outer corona-lobes and equipped with a conspicuous curved dorsal horn which stands between the corresponding pair of "mandibles" of the outer corona, almost touching their tips.

Type locality: South West Africa: near Aus.

Distribution: Also in Great Namaqualand: lower slopes of kopje above the pass leading down to Gründoorn; Cape Prov.: Prieska Distr.

This is another of the quintet of *Trichocaulons* discovered by Dr. Marloth. He collected it between weathering granite boulders near Aus in South West Africa at an elevation of 4000 feet. The specific name means "having the form of an apple-shaped melon," from the Greek word *Melos*, originally signifying an apple, and later a melon shaped like an apple. The reference is to the nearly globose short spineless stems, which frequently grow solitary, though by no means always so. The small flowers appear at the obtuse apex of the stems. According to Dr. Marloth they are dark claret outside, yellow marked with dark maroon spots inside and the tips of the corolla-lobes wholly dark maroon. The outer corona is described as having the lobes bifid, and the inner corona-lobes as having a conspicuous curved dorsal horn. For the similarity of

this coronal structure to that of *T. engleri*, see p. 993.

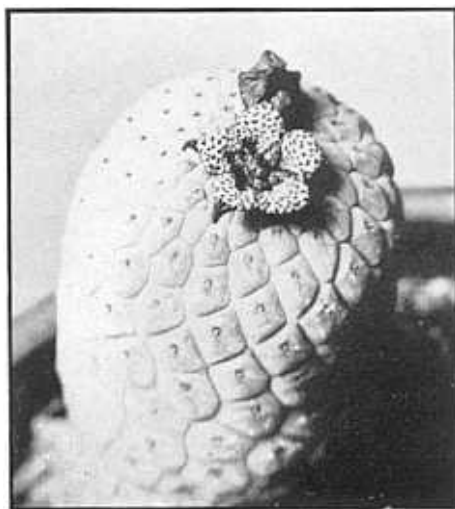


FIG. 1104

Trichocaulon meloforme Marloth x 1.5

23. *Trichocaulon engleri* Dinter, Neue Pfl. Deutsch-Südw.-Afr., 56. 1914.

(Description based on that by Prof. Kurt Dinter, l.c., translated from the German) :

Stems: 13 to 16 cm. long, 5 to 8 cm. thick, clavate, branching close to the ground, covered with irregular hexagonal tubercles; leaves only on the very new growth, 1 mm. long, 1 mm. broad, acute;

Flowers: 8 to 14 together, successively developed, on the upper part of the stems;

Pedicel: 3 mm. long, 1 mm. thick;

Sepals: 1 mm. long, broadly ovate, acute;

Corolla: 12 to 15 mm. in diameter, broadly campanulate, red-brown outside, yellow-green inside with round black-brown dots or cream color with red-brown dots, finely papillate; *tube* with 5 concavities or depressions corresponding in position to the 5 corolla-lobes; *lobes* very much reflexed, 5 mm. broad at the base, triangular, acute;

Outer corona: at the base shortly cup-shaped, with 15 acute teeth, in 5 groups of 3 each, appressed to the corolla; the 2 lateral teeth in each group arching together at their tips, with a short acute tooth in between, whose tip is curved backwards; entire corona red-brown and richly sprinkled with yellow;

Inner corona: lobes incumbent upon the anthers and then produced far above them as a column.

Type locality: South West Africa: near Kanus.

Distribution: Also from South West Africa: Klein Karas Mountain region; Cape Prov.: Kenhardt Distr.: Theronville.

"Engler's *Trichocaulon*" was named by Prof. Dinter for its discoverer, Prof. Adolf Engler, who was traveling with him in the southerly part of Great Namaqualand about 1910 when he discovered the plant. Only one specimen was found, but in October, 1913, Mrs. Dinter collected thirty more plants in the Klein Karas region. It is the tallest and thickest of the spineless *Trichocaulons*, the stems attaining nearly 7 inches and branching freely from the base. The youngest tubercles bear minute pointed rudimentary leaves. The flowers develop freely all over the upper portion of the stems. They are $\frac{1}{2}$ -inch in size and finely papillate within. The color seems to be variable, being described by Prof. Dinter as yellow-green to creamy with dark red to reddish-brown spots, and by Mr. Luckhoff as pale lemon-yellow with large dark purple spots of uniform size. Except in their larger size, the flowers are closely similar

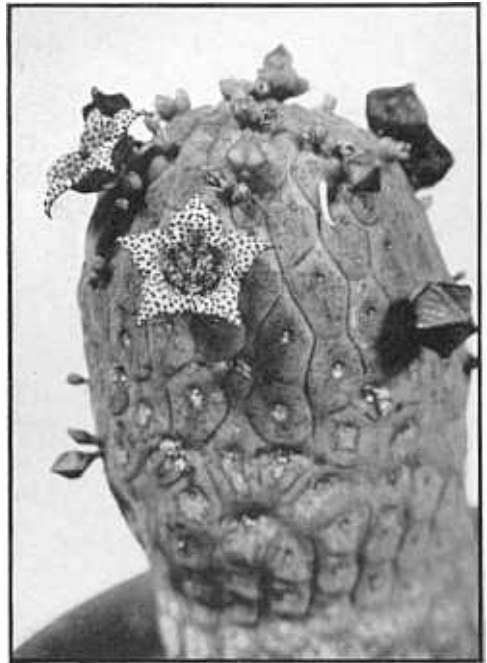


FIG. 1105

Trichocaulon engleri Dinter x

to those of *T. simile*, the principal structural difference being in the character of the inner corona-lobes, which, after bending over the anthers, are then produced far above them in a tall shaft. The species is one of the most desirable of the *Trichocaulons* for cultivation, as it is much less susceptible to sudden death by rotting from within than are most of the species in this temperamental genus.

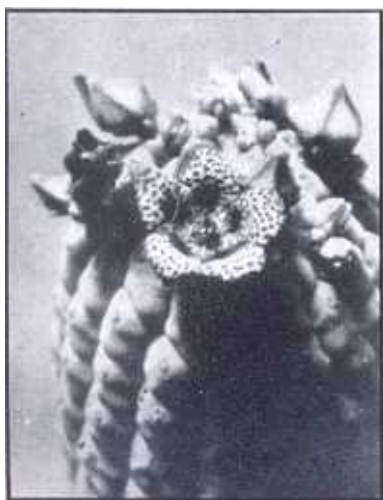


FIG. 1106

Trichocaulon engleri Dinter x 2.5

Photo by James West.



FIG. 1107

Trichocaulon keetmanshoopense Dinter x 1.6

Photo by Carl Luckhoff.

24. *Trichocaulon keetmanshoopense* Dinter, Neue Pfl. Deutsch-Südwest-Afr., 57, false *keetmanshoopensis*. 1914.

(Description based on that by Prof. Kurt Dinter, l.c., translated from the German):

Plant: composed of 1 to 6 stems; *stems* up to 15 cm. high, not over 4 cm. thick, violet-grey or yellow-brownish, with a very uneven surface covered with rounded tubercles; leaves $\frac{1}{2}$ mm. long, consisting of tiny appressed tips;

Flowers: up to 5 together from the grooves between the tubercles on the upper half of the stems;

*Pedice*l: 1 mm. long;

Sepals: $1\frac{1}{2}$ mm. long, ovate, shortly acuminate, glabrous;

Corolla: in bud pentagonal, flat at the top with conspicuously high tips of the corolla-lobes; when expanded 10 to 14 mm. in diameter, rotate-campanulate, glabrous within; *lobes* broadly ovate, acuminate; ground color of the corolla varying from whitish-green to greenish-yellow, with red-brown spots which also are variable in size;

Corona: $3\frac{1}{2}$ mm. high;

Outer corona: of 10 "mandibles," which are erect, recurving, arching and converging in pairs with the tips touching, yellow with red dots;

Inner corona: lobes incumbent upon the anthers and produced $1\frac{1}{2}$ mm. above them in a slender little column.

Type locality: South West Africa: between Keetmanshoop and Aub.

Distribution: Also from South West Africa: near Kanus; Cape Prov.: Kenhardt Distr.: near Kakamas.

Collected by Prof. Dinter on karroo slate formation near Keetmanshoop, 200 miles inland from Lüderitz Bay, in January, 1910. It is a tall species, the stems to 6 inches high, of a more cylindrical shape than that of most of the globose *Cactoideas*. The stem tubercles are prominent and tipped with tiny rudimentary leaves. When in bud the flowers are conspicuous for the pointed shape assumed by the corolla-lobes. When expanded the $\frac{1}{2}$ -inch flowers exhibit varying pale greenish shades, with irregular spots. They are bell-shaped, but have no

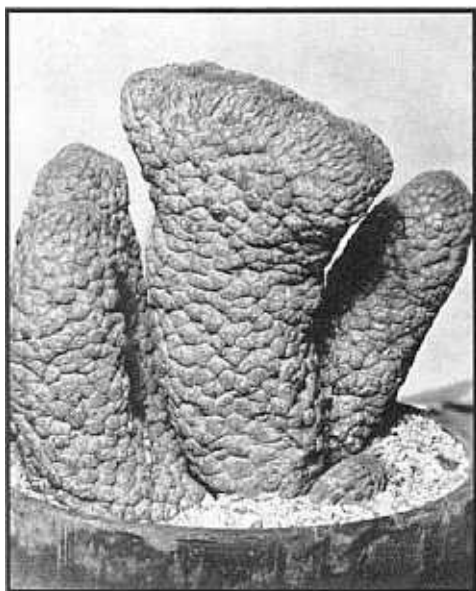


FIG. 1108

Crested stem of *Trichocaulon keetmanshoopense* Dinter x 0.5



FIG. 1109

Trichocaulon keetmanshoopense Dinter x 2.

distinct central tube and the inner corolla surface is not papillate. In general the *Trichocaulons* are more rarely papillate when they have no distinct tube, but there are exceptions to the rule. The outer corolla-lobes are bifid, the tips of the segments arching together in pairs like the proverbial "mandibles," so that the tips are said to touch, but they do not appear always quite to do so. The inner corolla-lobes are produced above the anthers, jointly forming a slender shaft, as in *T. engleri*, but very much shorter.

25. *Trichocaulon marlothii* N. E. Brown, Flora Cap., iv. i. 894. 1909.

(Description by Dr. Brown, l.c.):

Plant: 3 to 4 in. high, with 3 to 4 cylindric or cylindric-ovoid branches $1\frac{1}{2}$ to $1\frac{3}{4}$ in. thick, narrowed below, obtuse, covered with crowded obtuse tubercles 2 to 3 lin. in diameter, tipped with a minute point seated in a small depression, glabrous, pale greyish;

Flowers: 2 to 5 together between the tubercles, subsessile or with pedicels up to $\frac{1}{2}$ lin. long, developing successively;



FIG. 1110

Dr. Rudolf Marloth

Photo by I. B. Pole Eva

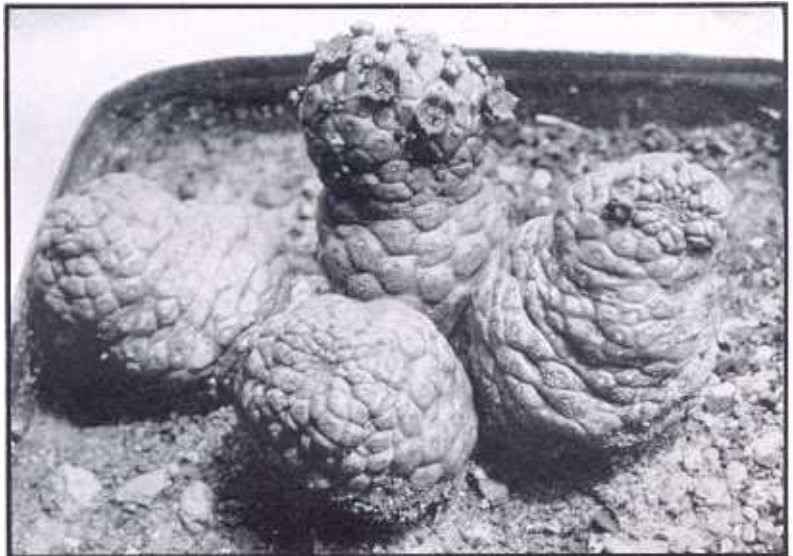


FIG. 1111

Trichocaulon marlothii N. E. Brown x 0.75

From the collection of David Pringle

Sepals: $\frac{1}{2}$ lin. long, $\frac{1}{2}$ to $\frac{2}{3}$ lin. broad, broadly ovate, acute, glabrous;

Corolla: flat-topped and very shortly pointed in bud; when expanded about 4 lin. in diameter, lobed to half-way down, without a distinct tube, the united part flattish or saucer-shaped, glabrous and smooth outside and within, not ciliate; *lobes* spreading, $1\frac{1}{3}$ lin. long and broad, nearly like an equilateral triangle in outline, acute, dark purple-brown (*Marloth*);

Outer corona: divided into 10 filiform-subulate teeth $\frac{1}{2}$ lin. long, arranged in pairs behind the inner corona-lobes, very spreading, curving towards each other;

Inner corona: lobes $\frac{1}{2}$ lin. long, linear, obtuse, closely incumbent on the backs of the anthers and produced beyond them, with the tips probably connivent-erect.

Type locality: Cape Prov.: Kenhardt Distr.: near Kenhardt.

Distribution: Also in Cape Prov.: British Bechuanaland: Gordonia; South West Africa: Namib Desert; Auas Mountains; Modderfontein.

"Marloth's *Trichocaulon*" is named for the much-loved South African botanist, the late Dr. Rudolf Marloth, who detected it about 1905 near Kenhardt, in the northern part of the Cape Province, just south of the Orange River. The plant is 3 to 4 inches

tall, similar in habit to *Trichocaulon cactiforme*. The flowers are saucer-shaped or flat on the disk, with no distinct tube, glabrous and smooth throughout. The outer corona-lobes are 2-toothed, the teeth spreading and recurved towards each other.

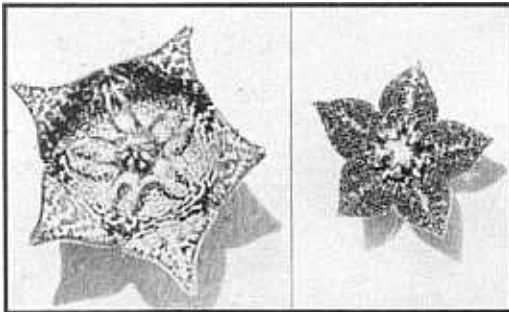
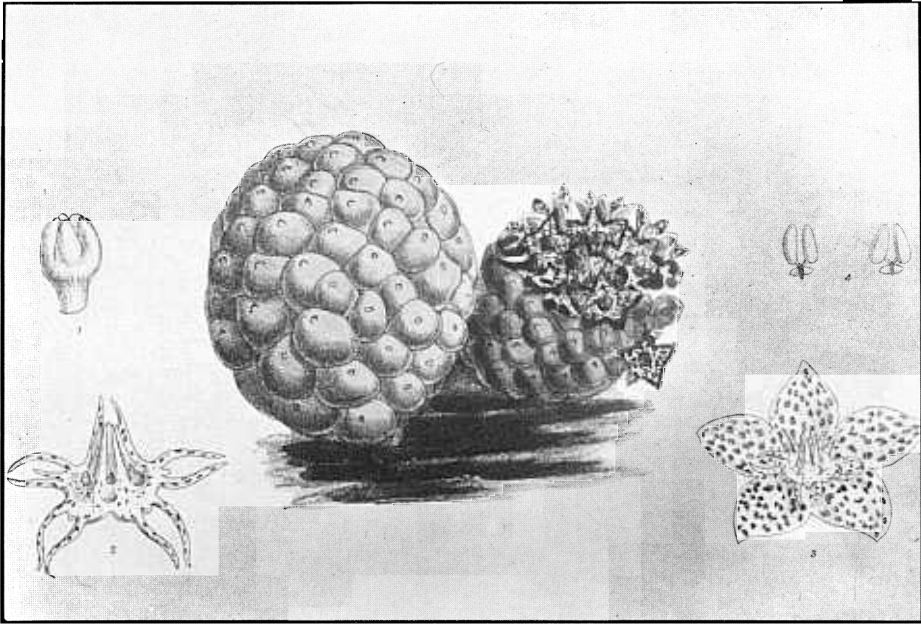


FIG. 1112

(At left) *Trichocaulon marlothii*
N. E. Brown x 4.

Photo by Ernst Rusch, Jr., of a flower from near Sendlingsdrift, north of the Orange River. (At right), Flower of an unidentified *Trichocaulon*, x 4. probably new, from Pockenbank, South West Africa.



N. E. Brown x
Botanical Magazine.

26. *Trichocaulon pictum* N. E. Brown, Kew Bull., 307. 1909.

(Description by Dr. Brown, l.c., translated from the Latin):

Stems: subglobose or cylindric-oblong, very obtuse, single or very scantily branching from the base, 4 to 7 cm. long, 4 to 5 cm. thick, irregularly tessellate-tuberculate, glabrous; tubercles 6 to 10 mm. in diameter, very obtuse, at first minutely apiculate;

Flowers: 2 to 4 in fascicles, erect;

Pedicel: 2 mm. long, glabrous;

Sepals: 1 to 1½ mm. long, broadly ovate, acute, glabrous;

Corolla: 9 mm. in diameter, glabrous, outside smooth, inside minutely rugulose, pale (whitish or yellowish?) marked with numerous purple-brown dots and short lines; *tube* broadly plate-shaped; *lobes* very spreading, 2½ mm. long, 3 mm. broad, broadly deltoid-ovate, acute;

Outer corona: lobes trifid, 1½ mm. long, reaching almost to the sinuses between the corolla-lobes, pale-colored marked with purple-brown spots;

Inner corona: lobes 1½ mm. long, linear, acute, produced above the anthers with connivent-erect tips, pale colored with purple-brown margins.

Type locality: Cape Prov.: Little Namaqualand: without precise locality.

Distribution: Little Namaqualand: north-west slopes of the quartzite hills south-west of Chubiessis; Pella; 28 miles north-east of Port Nolloth.

The "painted *Trichocaulon*" is the last of the *Trichocaulon* quintet discovered by Dr. Marloth. He collected it in Little Namaqualand about 1908. The stems are

2 to 3 inches high, solitary or branching sparingly from the base. The flowers are under a half-inch in diameter, wholly glabrous, but minutely rugulose inside, with-

out papillae and without a central tube, dotted and lined in purple-brown on a pale ground. The outer corona-lobes are divided into three segments each, but according to Dr. Marloth they differ from those of *Trichocaulon simile* in that the middle segment is itself bifid, while in *T. simile* it is entire. This detail does not appear in the

dissection of the corona in Fig. 1113. The general habit of the plant can hardly be distinguished from that of *T. cactiforme*, but the flowers may be recognized without much difficulty as they are the only ones among the *Cactoideas* devoid of a corolla-tube which have these trifid outer corona-lobes.



FIG. 1114
Trichocaulon pictum N. E. Brown x 0.5
Photo: G. W. Reynolds, Johannesburg, of a plant from Pella, Little Namaqualand.

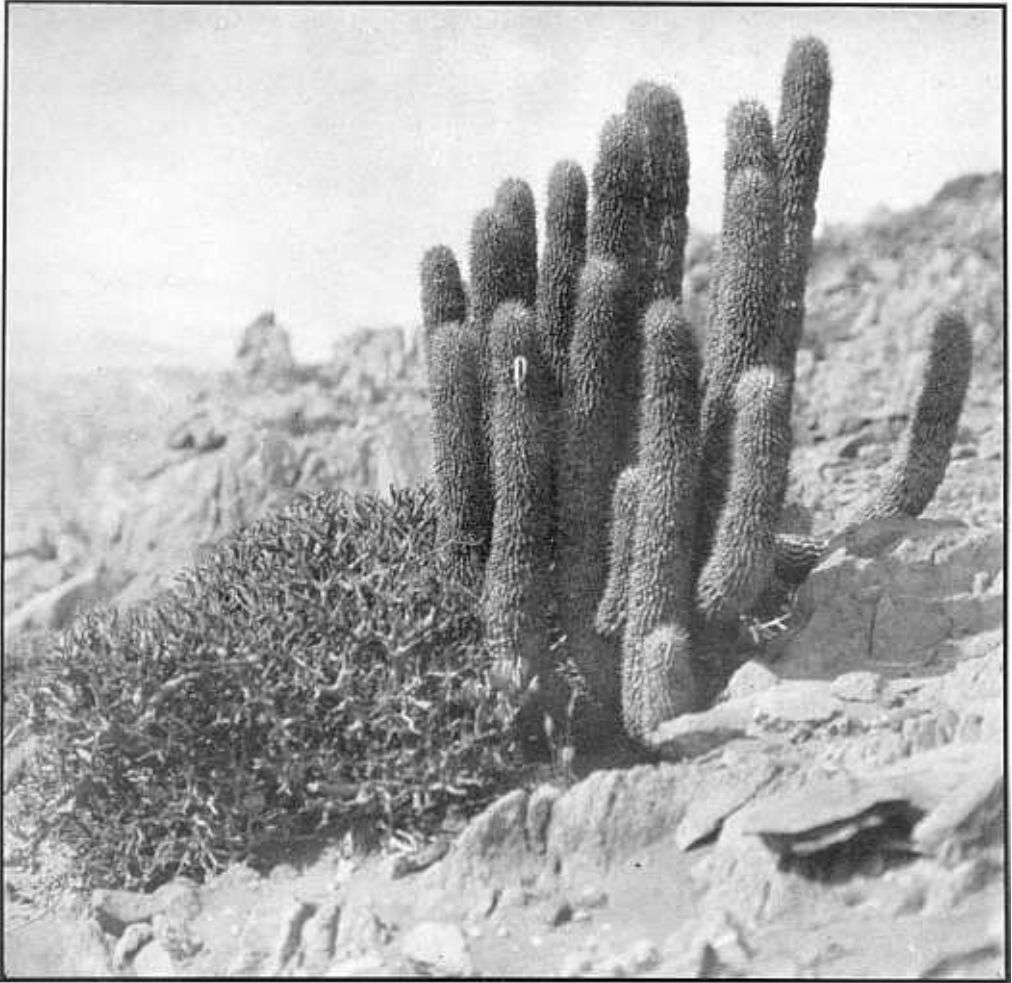


FIG. 1115

Trichocaulon halenbergense Dinter

Photo by Carl Luckhoff of a plant growing in the Halenberg Mountains. The plant is about 5 feet in height. The dried seed-pod on one stem is $3\frac{1}{2}$ inches long.

Trichocaulon halenbergense Dinter, Fedde: Repertorium, xxix. 163. 1931.

Type locality: South West Africa: Great Namaqualand: hills near Halenberg Station.

Distribution: Also 4 miles from the Orange River, north of Sendlingsdrift.

The "Halenberg *Trichocaulon*" is an undescribed species, mentioned by Prof. Dinter in an account of his stay near Lüderitz Bay, South West Africa, early in 1929. "I reached Lüderitz Bay," he wrote, "at the most unfavorable time of year imaginable, the beginning of January. So severe a drought was prevailing and the flora made

so wretchedly sorrowful an impression that I made my stay as short as possible. . . . I made a very unsatisfactory excursion from Lüderitz Bay to the Kavis Mountains only 35 kilometers away and to the railroad station at Halenberg, 20 kilometers further east. In the gneiss hills near there I discovered a new tall spiny *Trichocaulon* (*T.*

halenbergense Dinter) with sulphur-yellow flowers."

The large size of the plants and the sulphur-yellow color of the flowers suggests a relationship with *T. grande*; but the distance between their habitats makes it probable that the two species are botanically distinct.



FIG. 1116

Trichocaulon halenbergense Dinter

Photo by E. Rusch, Jr., of a flowering stem from Great Namaqualand, about 4 miles north of the Orange River, near Sendlingsdrift.

Trichocaulon karasmontanum Dinter, Fedde: Repertorium, xxiv. 16. 1927.

The "Karas Mountain *Trichocaulon*" is South West Africa. It is stated to be a
an undescribed species from the southerly "spiny species with inconspicuous flowers."
extremity of the Klein Karas Mountains in

Type locality: South West Africa: Great Namaqualand: near Ussisschlucht.

Distribution: Not further known.

FIG. 1117

Trichocaulon sp.

Photo by Ernst Rusch, Jr., of a flower from the Kahans Mine, South West Africa, a mile north of the Orange River and 10 miles east of Sendlingsdrift. This probably represents an undescribed species.

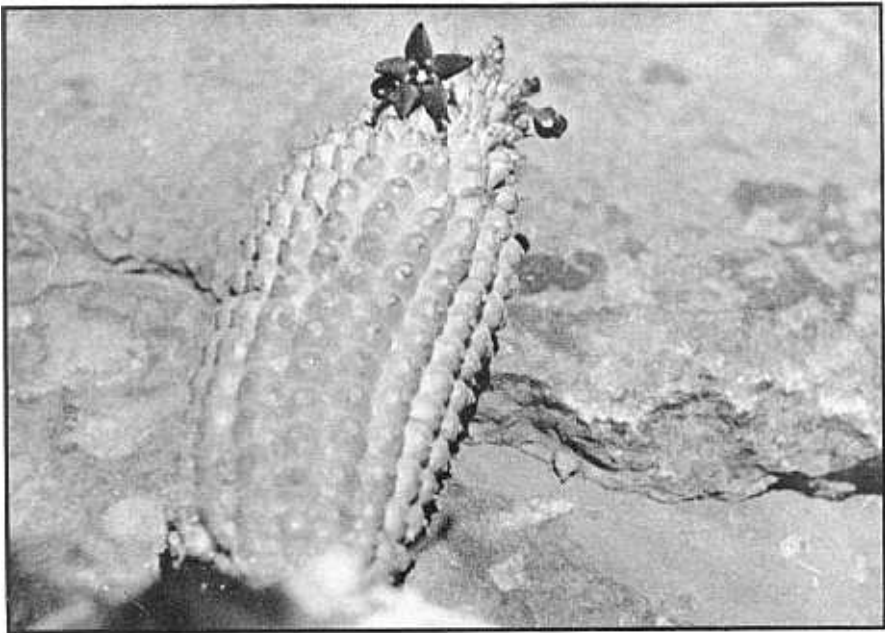


FIG. 1118

Trichocaulon sp.

Photo by R. H. N. Smithers of a plant from the Urib Ubib Mountains, Usakos district, South West Africa. It may represent a new species, or be allied to *T. pedicellatum*.

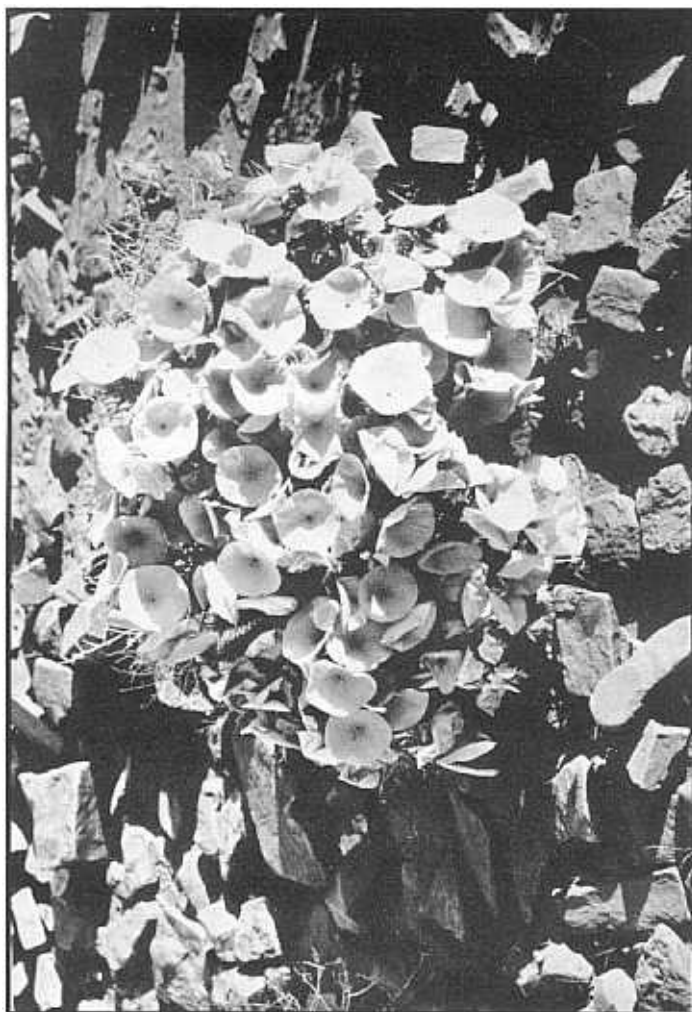


FIG. 1119

Hoodia gordonii Sweet

Photo by Herbert Lang.

HOODIA Sweet, Hort. Brit., 2 Ed., 359. 1830.

Monothylaceum G. Don, Gen. Hist., iv. 116. 1838.

Scytanthus Hooker, Icon. Pl., t. 605. 1844.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 896):

Plants: stout succulent perennials, bushily branched, leafless; *stems* very thick, cylindric, with many tuberculate angles; tubercles spine- or bristle-toothed;

Flowers: large and showy, in small clusters of 2 to 5 or sometimes solitary, arising from the grooves between the angles of the stem towards or at the top, developing successively;

Calyx: 5-partite;

Corolla: large, flat, concave or cup-shaped, with a very small proper tube, just enclosing the corona; *limb* obsolete or but slightly 5-lobed; *lobes* abruptly terminated by a subulate point, valvate in bud;

Corona: double, arising from the staminal column;

Outer corona: of 5 concave spreading lobes, emarginate or bifid at the apex;

Inner corona: of 5 linear lobes incumbent upon the backs of the anthers, dorsally connected to the outer corona by 5 short partitions;

Staminal column: arising from near the base of the small corolla-tube; *anthers* incumbent on the top of the style, subquadrate, without an appendage at the apex; *style* not produced beyond the anthers, truncate at the apex;

Follicles: elongated, terete-fusiform, solitary or in pairs, divaricate, smooth.

Type species: *Hoodia gordonii*.

Total species: 16.

Distribution: Angola, South West Africa, Cape Province and Bechuanaland Protectorate.

The genus *Hoodia* was erected by Robert Sweet in 1830. He dedicated it to "Mr. Hood, a cultivator of succulent plants," a

shadowy figure of whom no other mention has come to our notice. The genus was based on *H. gordonii*, which had been figured in Masson's *Stapeliae Novae*, 1796. This was a strange plant in the eyes of early botanists, and as late as 1844, in describing another species, Sir William J. Hooker spoke of the drawing in Masson's book as being so curious that many still considered it to be "an exaggerated, if not a fictitious representation." To-day all collectors of *Stapeliads* are familiar with the stoutly tuberculate spine-tipped stems of the *Hoodias*, but as the plants are shy bloomers in cultivation, if conditions are not exactly to their liking, their conspicuous circular flowers, with the corolla-lobes reduced in most species to short subulate tips, are always a surprise; and when a *Hoodia* blooms profusely, as shown for instance in Mr. Lang's delightful photograph, it is a great event.

It has been said that the *Hoodias* and the *Trichocaulons* form kindred genera, but the relationship between them must be regarded as very distant. The stems of the *Hoodias* resemble those of the *Eutrichocaulons*, but in general they have their angles, or ribs, more regularly aligned and somewhat more compressed. The plants attain a maximum height of about three feet, whereas some *Trichocaulons* are nearly twice as tall. The outer corona-lobes of the flowers are spreading, and usually notched or shortly and roundly bifid at the

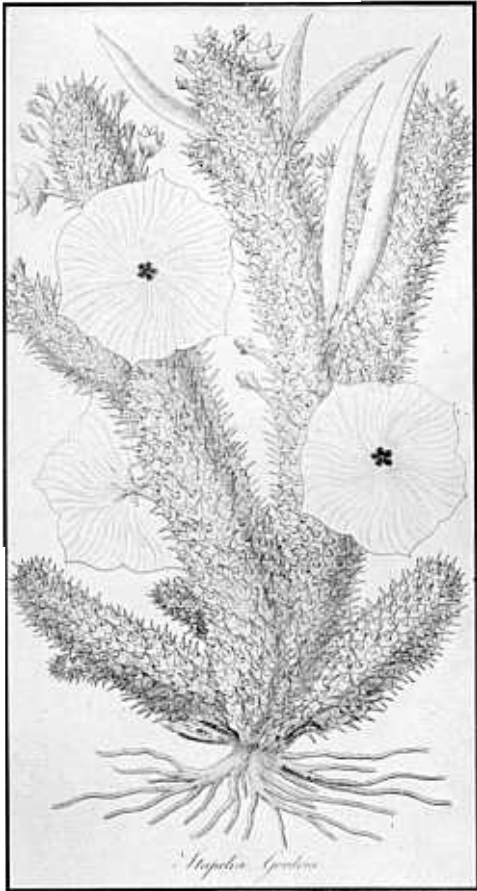


FIG. 1120

Hoodia gordonii Sweet x 0.25

From Masson: *Stapeliae Novae*, 1796

apex; but in one species, *H. barklyi*, the outer corona is slightly akin to *Trichocaulon* form, with the lobes much more deeply cleft than in the remaining species. The corollas of the two genera differ greatly, in size as well as in shape, that of *Hoodia macrantha* being thirty or forty times as large as that of *Trichocaulon sinus-lüderitzii*.

It is very easy to make a superficial classification of the *Hoodias*, and extremely difficult to diagnose them accurately. The difficulty comes from the large number of existing interlocking forms, many of which are still wholly undescribed. But it is not difficult to prepare a Key to the genus, because the inner corolla surface—alternately papillate and hairy throughout, or papillate on a central zone only and not hairy, or both smooth and glabrous all over—offers a series of categories enabling one to break up the genus into smaller groups, and then the individual species can be sorted out according to their size or color, their shape or the structure of the coronas.

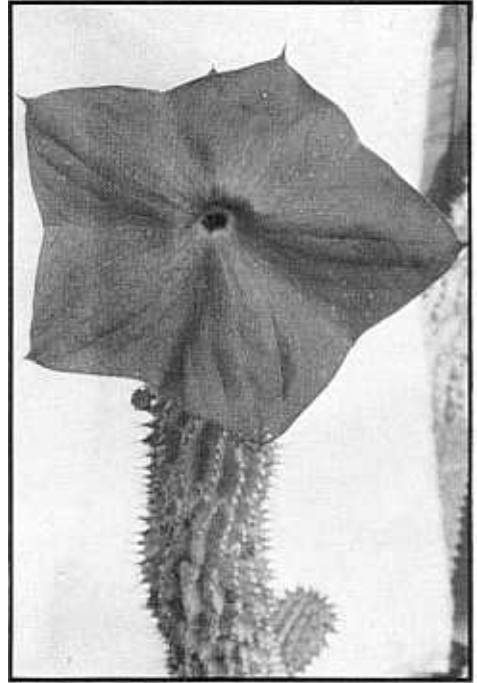


FIG. 1121

Hoodia macrantha Dinter

Example of a *Hoodia* (Key: I-A) with the corolla more or less covered with hairs or bristles, these arising from small tubercles or papillae; corolla over 6 inches in diameter. Photo by H. Herre of a flower in the collection of M. Otzen, Capetown.

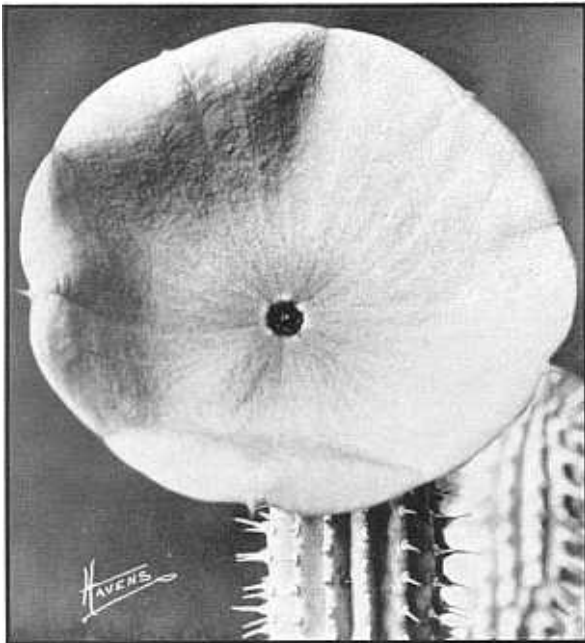


FIG. 1122

Hoodia gordonii Sweet x 0.75

Example of a *Hoodia* (Key: II) with the corolla papillate at centre, the papillae not (or very rarely) tipped with hairs or bristles. From W. I. Beecroft Gardens. Photo by Havens.

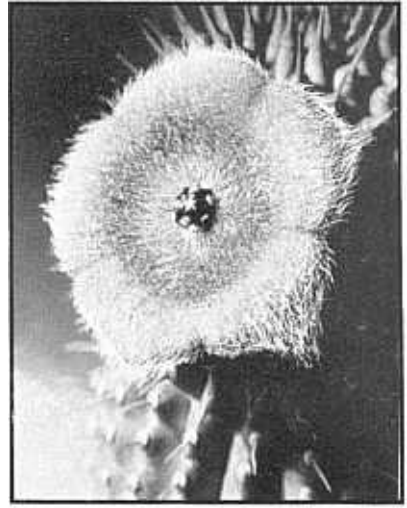


FIG. 1123

Hoodia dregei N. E. Brown x 1.

Example of a *Hoodia* (Key: I-B) with the corolla more or less covered with hairs or bristles, these arising from small tubercles or papillae; corolla under 6 inches in diameter. Photo by James West.

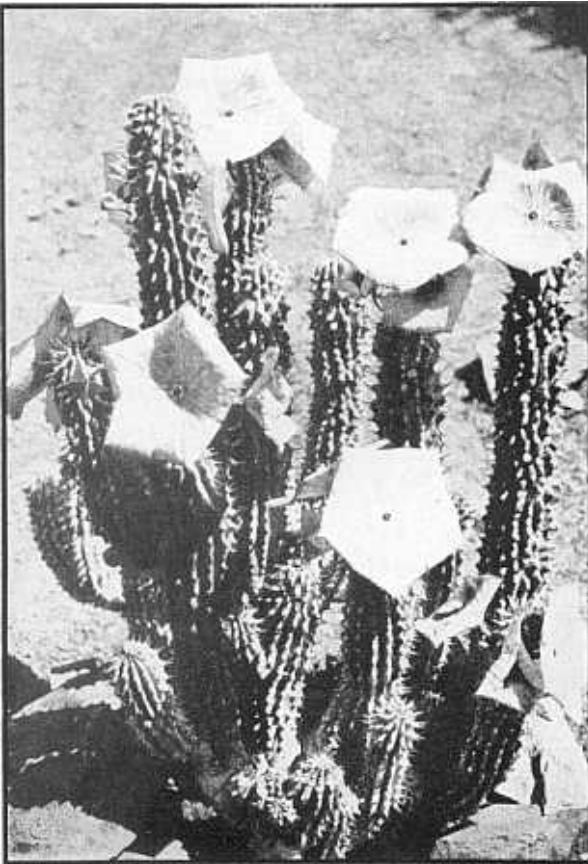


FIG. 1124

Hoodia bainii Dyer

Example of a *Hoodia* (Key: III) with the corolla glabrous and smooth throughout. Photo by Herbert Lang from the South Africa Pictorial Calendar, 1934.

KEY TO THE GENUS HOODIA

- I. Corolla covered throughout (or rarely at centre only) with scattering to very dense hairs or bristles, these arising from small tubercles or papillae:
 - A. Corolla very large, over 6 in. in diameter:
 - 1. Corolla purple, with dense soft erect purple hairs . . . 1. *H. macrantha* (7 to 8 in.)
 - B. Corolla under 6 inches in diameter:
 - 1. Corolla densely covered with long soft violet hairs:
 - a. Corolla brownish-red 2. *H. currori* (3½ to 5 in.)
 - 2. Corolla densely covered with soft white hairs:
 - a. Corolla light brown, the ground color scarcely visible under the dense hair covering 3. *H. dregei* (1½ in.)
 - 3. Corolla covered with scattering to dense rather colorless hairs or thin bristles not concealing the ground color:
 - a. Corolla 2 inches or more in diameter:
 - i. Corolla brick-red; outer corona-lobes deeply bifid 4. *H. lugardi* (2 in.)
 - ii. Corolla shell-pink, suffused with brown; outer corona-lobes deeply emarginate 5. *H. langii* (2 in.)
 - iii. Corolla rose-violet; outer corona-lobes subquadrate, with two diverging horns 6. *H. husabensis* (3 in.)
 - iv. Corolla shell-pink; outer corona-lobes truncate 7. *H. rosea* (3 in.)
 - b. Corolla under 2 inches in diameter:
 - i. Corolla red-brown, yellow at centre; corona unknown 8. *H. ruschii* (1½ in.)
 - ii. Corolla brownish (?) ; outer corona-lobes bifid to half-way down 9. *H. parviflora* (1 in.)
- II. Corolla with a papillate central area, the papillae not (or very rarely) tipped with hairs or bristles; glabrous and smooth elsewhere:
 - A. Corolla nearly flat:
 - 1. Stem tubercles tipped with light brown spines 10. *H. gordonii* (3 to 4 in.)
 - 2. Stem tubercles tipped with white spines 11. *H. albispina* (3 to 3½ in.)
 - B. Corolla concave 12. *H. pillansii* (2½ in.)
- III. Corolla glabrous and smooth throughout:
 - A. Corolla nearly flat:
 - 1. Corolla under 3 in. in diameter 13. *H. juttæ* (1 to 2 in.)
 - 2. Corolla over 3 in. in diameter 14. *H. burkei* (3½ to 4 in.)
 - B. Corolla concave:
 - 1. Outer corona cup-shaped, lobes ⅓ lin. long, emarginate 15. *H. bainii* (2½ to 3 in.)
 - 2. Outer corona-lobes deeply bifid, forming 10 equidistant deltoid-acute teeth 16. *H. barklyi* (2 in.)

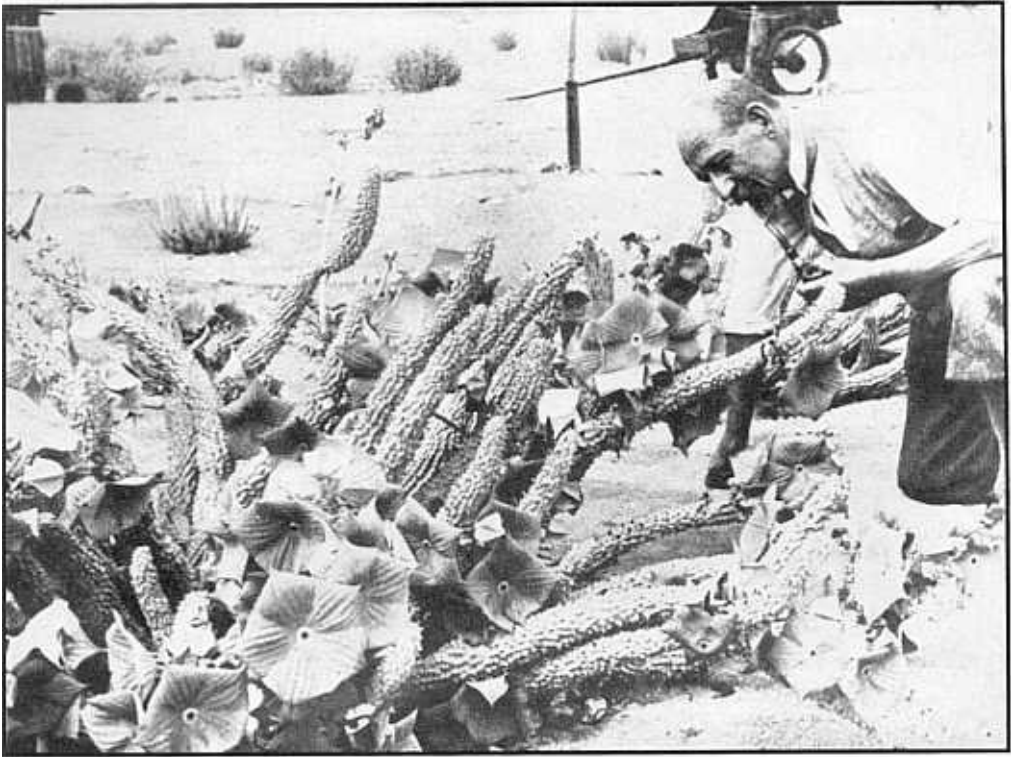


FIG. 1125.

Hoodia macrantha Dinter

Plant growing near railroad station at Onguati, South West Africa. Prof. Dinter at right. Photo by Dr. Boss.

1. *Hoodia macrantha* Dinter, Neue Pfl. Deutsch-Südw.-Afr., 35. 1914.

(Description by Prof. Dinter, l.c., translated from the German) :

Plant: forming clusters of as many as 20 *stems*, up to 80 cm. high, the thickest stems 8 cm. thick;

*Pedice*l: 3 to 4 cm. long, 5 to 6 mm. thick;

Sepals: 6 to 8 mm. long, pointed;

Corolla: rotate, flat; radius from centre of corona to the tips of the lobes 8 to 10 cm., from centre to the sinuses between the lobes 5 to 6 cm.; pointed tips of lobes 6 to 8 mm. long; bright purple when expanded, yellower along the principal nerves and within, becoming somewhat darker on the second or third day; the color hardly modified by the 2 to 3 mm. long thick erect purple hairs; *tube* crater-like, 4½ mm. deep, 6½ mm. in diameter at top, glabrous, orange-yellow, with a shining pentagonal ring 4 mm. wide of the same color surrounding the opening;

Corona: completely visible in the tube, but set 3½ mm. below the mouth, cup-shaped, cherry red;

Outer corona: of 10 lobes uniformly spaced;

Inner corona: lobes incumbent on the backs of the anthers.

Type locality: South West Africa: Usakos, 180 miles each of Swakopmund.

Distribution: Also from Onguati at the foot of the Erongo Mountains.

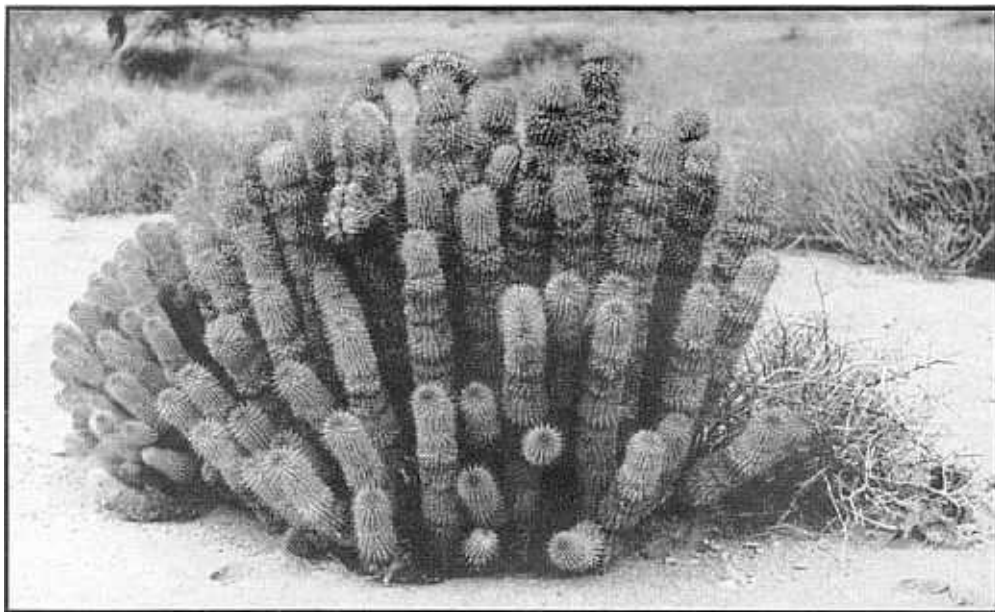


FIG. 1126

Hoodia macrantha Dinter

Plant with crested stems (see the enlargement in Fig. 1127) growing in its native habitat near Abbabis, Naukluft, South West Africa. Photo by Dr. Th. Arzt (Leicaphoto).

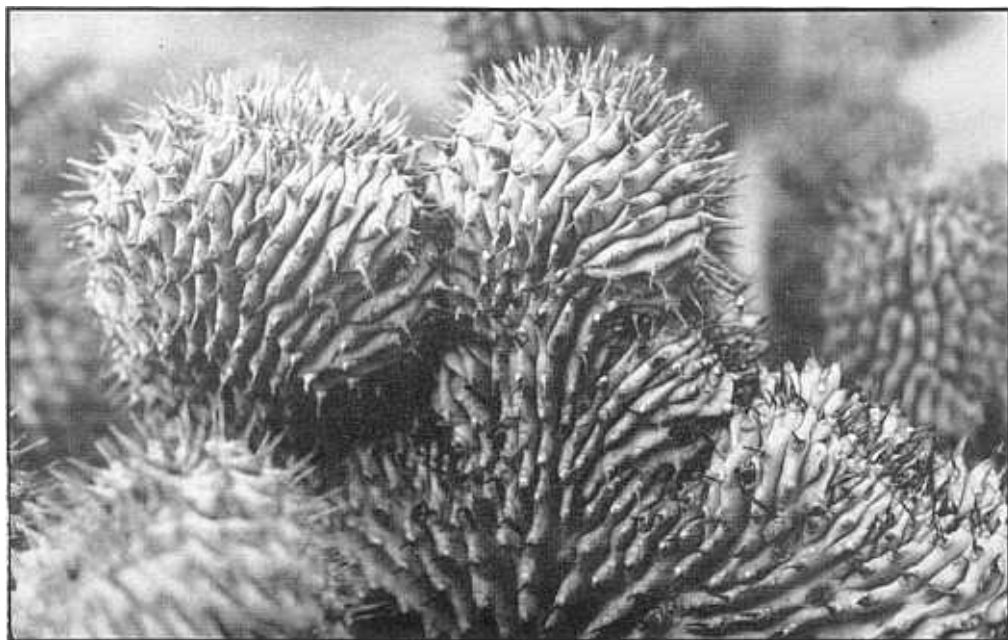


FIG. 1127

Crested stems of *Hoodia macrantha* Dinter

Photo by Dr. Th. Arzt. (Leicaphoto).

This "great-flowered Hoodia" is the mammoth species of the genus. The stems attain a height of 3 feet and a thickness of 3 inches. The hairy flowers are 8 inches in diameter, nearly twice as large as those of *Hoodia currori*. "I have cultivated this magnificent plant in my succulent garden since 1908," says Prof. Dinter, "where I readily propagate it through seeds or cuttings. Like all *Hoodias*, it will not live more than 3 or 4 years. In cultivation in South West Africa it flowers uninterruptedly from the beginning of the hot period, about the end of September, until March."



FIG. 1128

Hoodia macrantha Dinter x 0.1

Plant growing in front of the farm house of Count Finckenstein at Omaruru, South West Africa.
Photo by Dr. Th. Arzt (Leicaphoto).

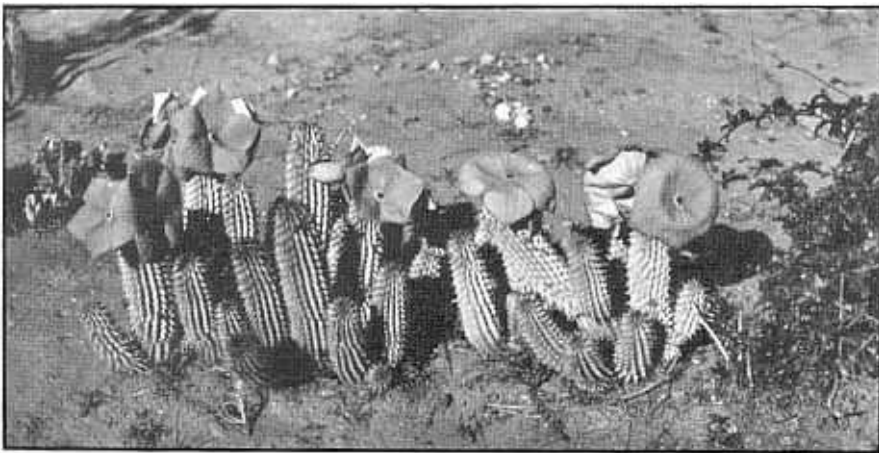


FIG. 1129

Hoodia macrantha Dinter

Photo by Prof. Dinter in Neue Pfl. D. S.-W. Afr., 1914.

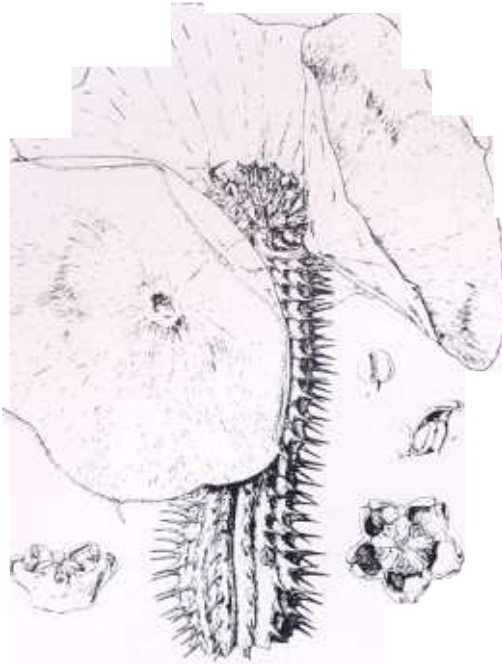


FIG. 1130

Hoodia currori Decaisne x 0.5
From Hooker's Icones Plantarum, 1844

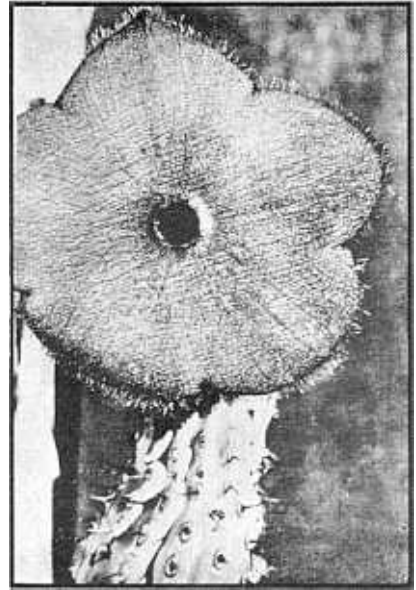


FIG. 1131

Hoodia currori Decaisne x 0.5
Photo by Prof. Dinter in Neue Pfl.
D. S.-W. Afr., 1914.

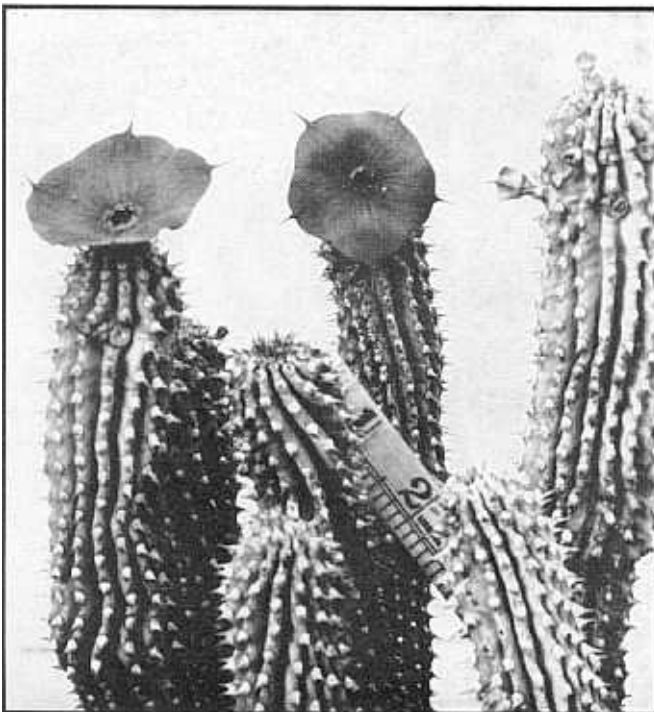


FIG. 1132

Hoodia currori Decaisne

Photo by G. C. Nel, of a plant near
the Swakop River, South West Africa.
If the identification is correct, the
great length of the corolla tips is
remarkable for this species.

2. *Hoodia currori* (Hooker) Decaisne, de Candolle: Prodrumus, viii. 665. 1844.

Scytanthus currori Hooker, Icon. Pl., t. 605-606. 1844.

Scytanthus burkei Hooker, Icon. Pl., t. 625. 1844.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 491):

Stems: 1½ to 2 ft. high, 2 to 2½ in. thick, cylindric, many-angled; angles sharply spine-toothed;

*Pedice*l: 6 to 8 lin. long, glabrous;

Sepals: ¼ in. long, lanceolate, acuminate, glabrous;

Corolla: 3½ to 5 in. in diameter, concave-rotate, slightly 4 or 5-lobed, glabrous outside, covered with hairs 1 to 2 lin. long within; *lobes* 2½ to 4½ times as broad as long, very obtuse, abruptly contracted into a subulate point ¼ in. long;

Outer corona: a shortly 5-lobed cup, glabrous; lobes bifid;

Inner corona: lobes linear, obtuse, incumbent on the backs of the anthers and not exceeding them, dorsally adnate to the outer corona, glabrous;

Follicles: 8 to 10 in. long, divaricate, terete, acuminate.

Type locality: Angola: Elephant Bay.

Distribution: Also from Angola: Benguela; South West Africa: Hereroland: Usakos; Otyimbingwe; etc.

This very handsome *Hoodia* was named for Dr. A. B. Curror of H. M. S. Water-Witch, who discovered it at Elephants Bay, Angola, in 1840. The tall strong plants, with thirteen or more stem-angles, bear

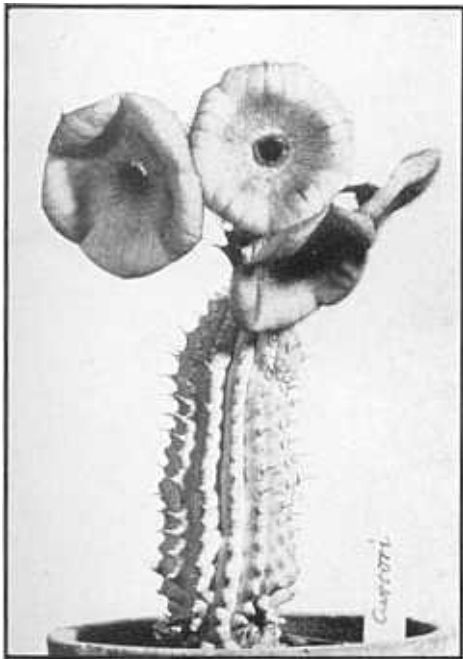


FIG. 1133

Hoodia currori Decaisne x (

Photo by R. H. Pulleine.

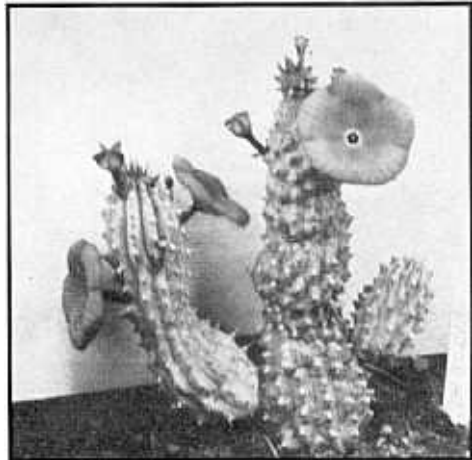


FIG. 1134

H. currori Decaisne x 0.2

Photo by R. H. Pulleine.

flowers often 5 inches in diameter, brownish on the outside, brownish-red within, with darker spots, thinly covered with long violet hairs. It has been collected at several points in Angola and throughout the northern parts of South West Africa, its range being at least 600 miles. It occupies the pre-eminent place among the hairy *Hoodias*, which *H. gordonii* holds among the hairless species, and its showy flowers render it a particularly desirable plant for cultivation.

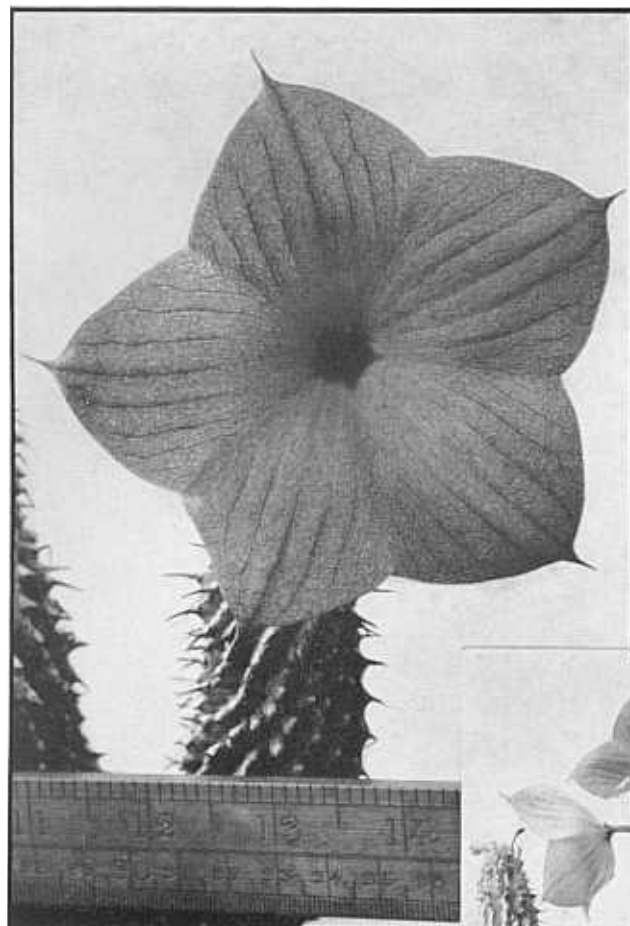


FIG. 1135
Hoodia gibbosa Nel x 1.
Photo by H. Herre.



FIG. 1136
Hoodia gibbosa Nel
Photo by H. Herre.



FIG. 1137

Hoodia gibbosa Nel x 0.3

Photo by H. Herre.

Hoodia gibbosa Nel, sp. nov.

(Description by Dr. G. C. Nel) :

Planta erecta, caespitosa, glauco-viridis; rami glabri, 14-costati; spini pungentes, nigri. Flores singuli vel 3-4 fasciculati, ad apicem inserti. Pedicellus glaber, cylindricus. Sepala ovato-lanceolata, acuta. Corolla subcircularis, sinuata, aristata, vinoso-purpurea, intus pilis purpureis oblecta, extus glabra, griseo-alba. Tubus aurantiacus, pars superior pilis purpureis oblecta, pars inferior glabra, tubi faux aurantiaca, 5-gibbosa. Corona atropurpurea; corona exterior sinuata, 5-radiata; coronae exterioris segmenta subquadrata, obtusa, emarginata; coronae interioris segmenta linearia, obtusa, antheris incumbentia, haud antheras superantia.

Plant: caespitose; *stems* 30 cm. high, up to 5 cm. in diameter, cylindrical, stouter at the base than towards the apex, glaucous-greenish, glabrous, 14-angled; angles straight to sinuous, very prominent; tubercles oblong to elliptical, tipped with very stiff blackish spines, 7 mm. long;

Flowers: single or in fascicles of 3 to 4 at the apex of the stems;

Pedice: 1.3 to 1.8 cm. long, glabrous, cylindrical;

Sepals: 4 mm. long, ovate-lanceolate, acute, purplish-green;

Corolla: in bud prominently 5-winged, ending in a fine point; when expanded 8 cm. in diameter, slightly concave, subcircular, margins distinctly pentagonal, with a short hollow protuberance at each sinus, and 5 awn-like tips 5 mm. long; outside shiny greyish-green; inside vinous-purple, covered with stiff straight purple hairs; *tube* 4 mm. deep, 5 mm. broad, cup-shaped, upper part beset with long dark purple hairs, lower part glabrous, orange-colored; mouth of tube irregular, with 5 orange-colored protuberances slightly overhanging the tube and giving a 5-starred appearance;

Outer corona: black-purple, cup-shaped, sinuous, with 5 subquadrate obtuse emarginate lobes, forming an irregular star-shaped body;

Inner corona: lobes linear, obtuse, incumbent on the anthers but not produced beyond these and thus leaving an open space above them.

Type locality: South West Africa: on the Sphinx, about 70 miles due east from Swakopmund.

Distribution: Not further known.

This very handsome hairy tropical *Hoodia* was discovered by Dr. Boss in June, 1935, about 70 miles inland from Swakopmund, or not quite half-way on a straight line between Walvis Bay and Windhoek, South West Africa. It flowered in February, 1936, at the University Botanical Garden, Stellenbosch, C. P. (No. 6921).

Dr. Nel has christened the species *Hoodia gibbosa* because of the orange-colored protuberances which overhang the mouth of the corolla-tube, giving the centre of the corolla a curious 5-starred appearance. In general *H. gibbosa* is related to *H. currori*, differing principally in the form of the outer corona. "In *H. currori*," writes Dr. Nel, "the outer corona consists of a regular oblong cup, with linear acute lobes; whereas the outer corona of *H. gibbosa* is a 5-starred cup, the lobes being quadrate and obtuse, emarginate, reflexed outwards and showing a slight sinus at the point where they are adnate to the inner corona-lobes. In *H. currori* there is no such sinus."

We regret that we received this species, as well as *H. montana*, while this book was in the printer's hands, too late to include in the Key.



FIG. 1138

Hoodia gibbosa Nel x 1

Photo by Carl Luckhoff.

***Hoodia montana* Nel, sp. nov.**

(Description by Dr. G. C. Nel):

Caulis ramosi, carnosii, 20-24-costati, glabri; anguli aculeati, spini acutati. Flos singulus inter angulos erumpens. Sepala glabra, ovato-lanceolata, acuminata. Corolla suborbiculata, subconcava, straminea, intus pilis multis longis purpureis oblecta, lobi aristati. Tubus brevis, purpureus, pars superior pilis multis purpureis oblecta, pars inferior glabra; faux tubi aurantiaco-lutea, pilis purpureis oblecta. Corona exterior cupulaeformis, segmenta purpurea, bifida, margo atro-purpureus; coronae interioris segmenta purpurea, linearia, obtusa, antheris incumbencia, haud antheras superantia.

Plant: 20 cm. high; *stems* 2 to 4.5 cm. thick, glabrous, glaucous-green, 20 to 24-ribbed; ribs straight to sinuous; tubercles ovate to elliptical, tipped with a stiff bristle 5 to 10 mm. long, the upper bristle somewhat longer than those lower down on the stems;

Flower: single, arising from the upper end of the stems, between the ribs;

*Pedice*l: glabrous, 4.5 cm. long, cylindrical;

Sepals: ovate-lanceolate, acuminate, 2 mm. long and 3 mm. broad at the base;

Corolla: 9 cm. in diameter, light yellow, thickly covered on inner surface with fairly stiff purplish hairs 1 mm. long, subconcave, suborbiculate, showing sinuses between the lobes, and the lobes tipped with subulate points 5 to 7 mm. long; *tube* 5 mm. deep, 1 cm. in diameter, irregularly orbiculate, dark purplish-red, upper part profusely covered with long dark purplish hairs, lower part glabrous; mouth of tube surrounded by an orange-yellow circular zone 2 to 3 mm. broad covered with long purplish hairs;

Outer corona: a 5-lobed cup, the lobes bent inwards, bifid, purplish margined in dark purplish black;

Inner corona: lobes linear, obtuse, incumbent on the backs of the anthers, and not produced beyond them nor meeting in the centre.

Type locality: South West Africa: Brandberg, growing on sides of mountain on granite.

Distribution: Not further known.

The "mountain Hoodia" was discovered by Dr. G. C. Nel in November, 1935, on the mountain side above Brandberg, South West Africa. It flowered in February, 1936, at the University Botanical Garden, Stellenbosch, C. P., (No. 6916).

"This is a distinct species," Dr. Nel writes us, "and differs from *H. currori*, to which it is allied, by the much longer pedicel. The outer coronas of these two species are very similar."

3. *Hoodia dregei* N. E. Brown, Flora Cap., iv. i. 897. 1909.

(Description by Dr. Brown, l.c.):

Stems: $1\frac{1}{2}$ in. or more in diameter, with 20 to 24 tuberculate ribs, glabrous; tubercles conical, tipped with a stiff bristle $2\frac{1}{2}$ to 3 lin. long;*Pedice*l: short, becoming about 5 lin. long in fruit, glabrous;*Sepals*: $1\frac{1}{2}$ to 2 lin. long, lanceolate-subulate, glabrous;*Corolla*: of the dried specimen $1\frac{1}{4}$ to $1\frac{1}{3}$ in. in diameter, probably cup- or saucer-shaped, slightly and broadly 5-lobed, glabrous outside, thickly covered all over inside with simple hairs $\frac{2}{3}$ to 1 lin. long; *lobes* obtuse, tipped with a subulate point $1\frac{1}{4}$ to $1\frac{1}{2}$ lin. long;*Outer corona*: cup-shaped, with 5 short transversely oblong emarginate or shortly and broadly bifid lobes, blackish-purple;*Inner corona*: lobes $\frac{1}{2}$ lin. long, linear, obtuse, incumbent on the backs of the anthers and not produced beyond them, dorsally adnate to the outer corona, blackish-purple.

Type locality: South Africa: without locality.

Distribution: Cape Prov.: Prince Albert Distr.: Doorn River; Beaufort West Distr.: Letjesbosch.

Discovered by J. F. Drège about 1830, and then not collected again for nearly a century. Finally it was rediscovered in the Karroo of Prince Albert district by Dr. R. Broom. It is a very desirable species, re-

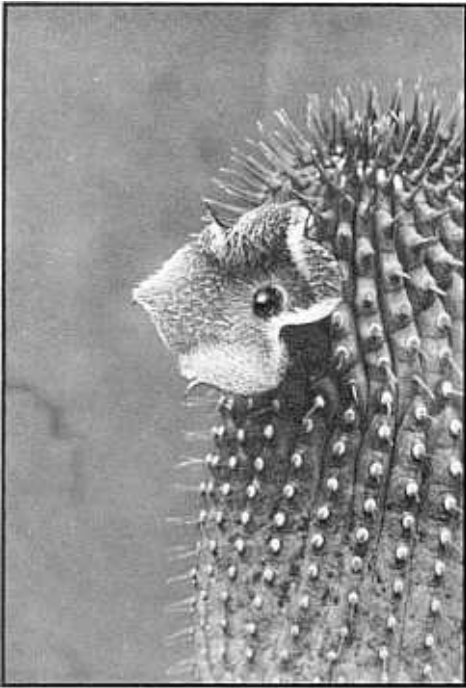


FIG. 1139

Hoodia dregei N. E. Brown x 1

Flower opening in early morning.

Photo by James West.

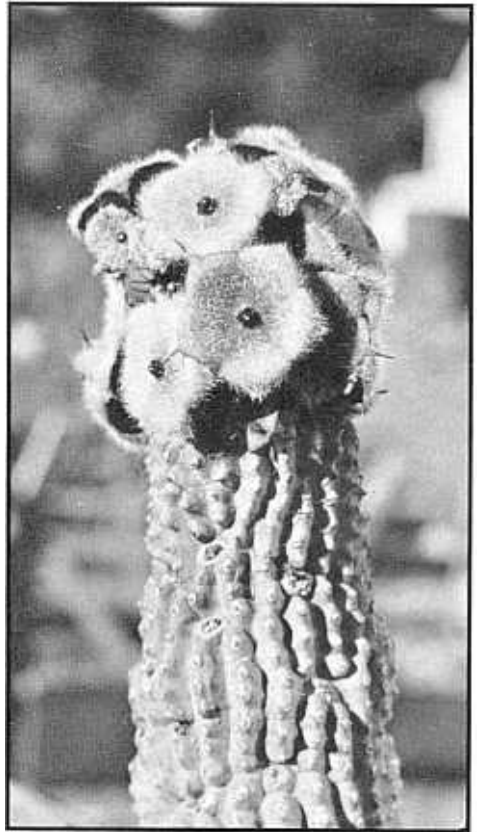


FIG. 1140

Hoodia dregei N. E. Brown x 0.5

Photo by Miss Mia C. Karsten.

sponding easily to cultivation and flowering more freely than some of the other *Hoodias* when potted. The small flowers, $1\frac{1}{2}$ inches in diameter, are very striking, for the corolla-lobes are more deeply indented than in other *Hoodias* and the en-

tire inner face of the corolla is so completely covered with simple white hairs that its light brown ground-color can hardly be distinguished at all, recalling on a small scale the effect of the flowers of *Stapelia senilis*.

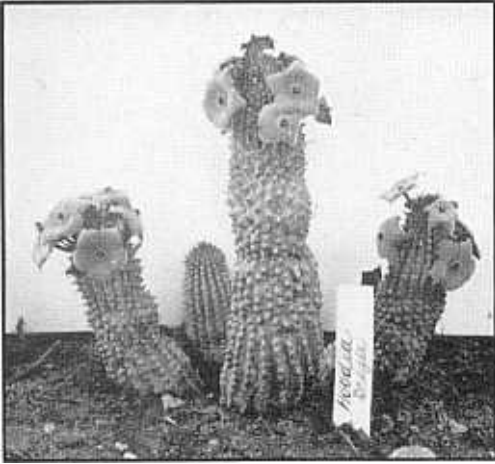


FIG. 1141

Hoodia dregei N. E. Brown x 0.12

Photo by R. H. Pulleine.

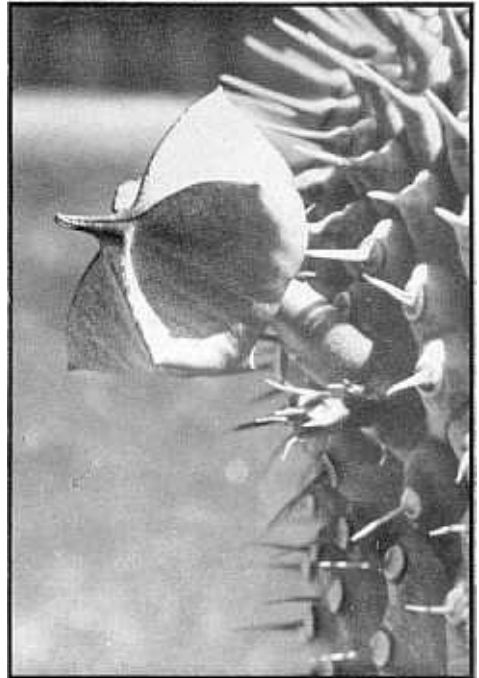


FIG. 1142

Bud of *Hoodia dregei* N. E. Brown

Photo by James West.

4. *Hoodia lugardi* N. E. Brown, Flora Trop. Afr., iv. i. 491. 1904.

(Description by Dr. Brown, l.c.):

Stems: "erect, to 2½ ft. high, thorny" (*Lugard*);*Pedice*l: ¼ to ⅓ in. long in the specimens seen, stout, glabrous;*Sepals*: 2⅓ to 2¾ lin. long, 1⅓ to 1½ lin. broad, ovate, acuminate, glabrous;*Corolla*: about 2½ in. in diameter, "brick-red" (*Lugard*), concave-rotate, obsoletely 5-lobed, each lobe very abruptly terminated by a subulate point 4 to 5 lin. long, glabrous outside, thinly covered with hairs ¼ to 1 lin. long within, each hair arising from a minute tubercle and probably erect;*Outer corona*: shortly cupular, 5-lobed; lobes obtusely and deeply bifid, dark purple-brown or blackish, glabrous;*Inner corona*: lobes ½ lin. long, linear-oblong, obtuse, incumbent on the backs of the anthers, dark purple-brown or blackish, glabrous;

Type locality: Bechuanaland Protectorate: Kalahari: Chukutsa Salt Pan.

Distribution: Not further known.

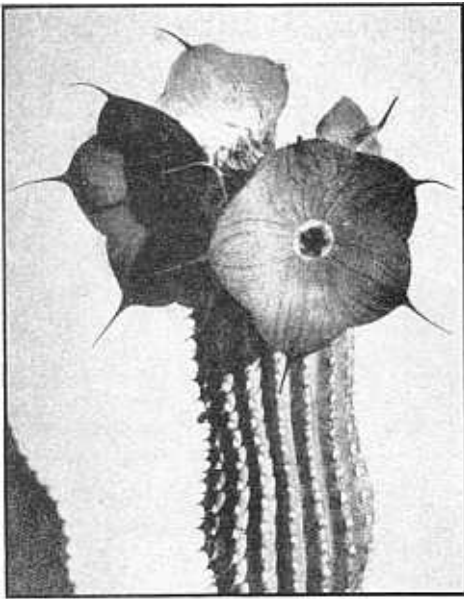


FIG. 1142-A

Hoodia lugardi N. E. Brown

Courtesy of the Cape Times, 1936.

"Lugard's Hoodia" is named for Major E. J. Lugard, who discovered it near the great Chukutsa Salt Pan in the Kalahari. It is one of the most interesting *Hoodias*, for it is the type, as it were, for a considerable group of plants, distributed through the Bechuanaland Protectorate, British

Bechuanaland and South West Africa, whose distinguishing character is that the flowers, between 2 and 3½ inches in size, have the inner corolla surface, especially around the centre, dotted with small papillae tipped with some form of hair or bristle.

The condition of the type specimens in the Herbarium of the Royal Botanic Gardens, Kew, does not permit of an exact determination of the coronal form. Dr. N. E. Brown's description states that the outer corona-lobes are deeply bifid, and this would seem to be a guide in comparing the plant with others, such as *H. langii* (outer corona-lobes deeply emarginate), *H. husa-bensis* (outer corona-lobes subquadrate, with two divergent horns) and *H. rosea* (outer corona-lobes truncate).

In speaking of the *Hoodias* one must bear in mind the large number of these local forms, a little too distinct from one another to rank as varieties and sometimes a little too closely connected to be permanent species. Wilhelm Triebner at one time had in his garden at Windhoek as many as sixty distinct *Hoodia* plants, and the quartet of unnamed flowers, which we have selected on pages 1089 and 1090, gives some idea of the interplay of characters still awaiting study.

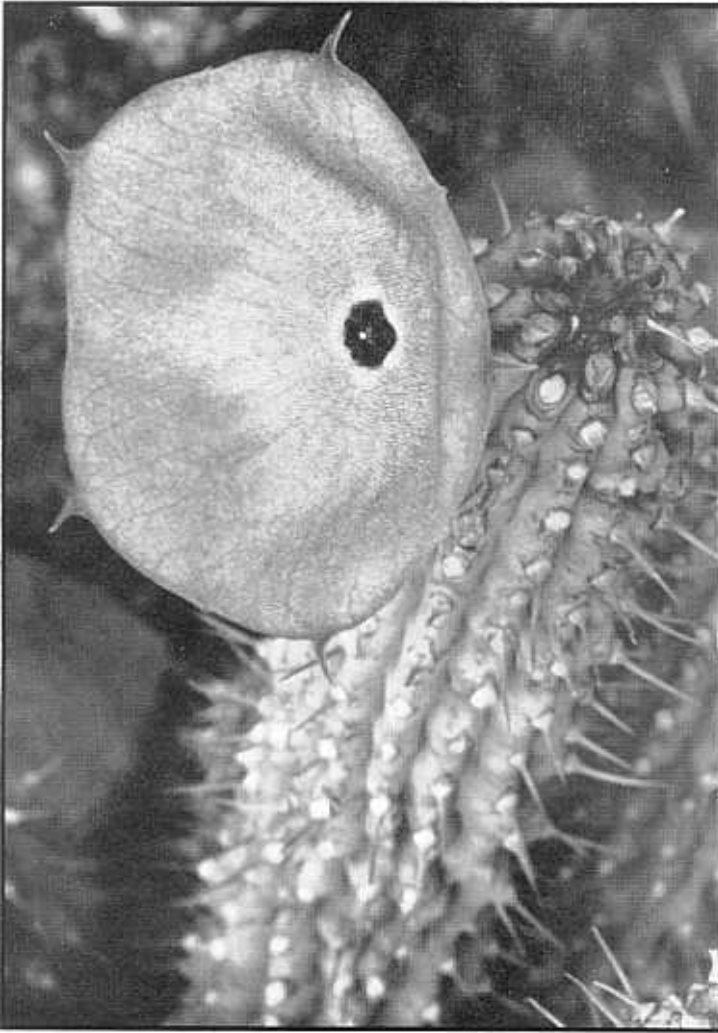


FIG. 1143

Hoodia langii Obermeijer et Letty x 1.8

Photo by Herbert Lang.

5. *Hoodia langii* Obermeijer et Letty, sp. nov.

Hoodia lugardi Phillips, Flow. Pl. So. Afr., t. 617. 1936. Nec N. E. Brown, 1904.

(Description by Miss A. A. Obermeijer and Miss C. Letty):

Planta circ. 40 cm. alta. Rami circ. 14-angulati, tuberculati, spinosi. Flores solitariae ad apicem ramorum dispositae; pedicelli 7 mm. longi. Sepala ovato-lanceolata, acuminata, 3 mm. longa, glabra. Corolla rotata, circ. 5 cm. in diametro, rosea, hirsuta; lobi 3 mm. longi, apiculati. Corona exterior subcrateriformis; lobi erecti, bidentati; coronae interioris lobi oblongi, antheris incumbentes.

Plant: about 40 cm. high, with many individual stalks emerging from the base and not branching above; stems 3 cm. in diameter with about 14 tuberculate angles, glabrous, green; tubercles tipped with pale brown spines 4 to 8 mm. long;

Flowers: solitary, situated toward the tips of the branches;

Pedice: 7 mm. long, stoutish;

Sepals: 3 mm. long, ovate-lanceolate, acuminate;

Corolla: 5 cm. in diameter, saucer-shaped and slightly concave, shell-pink suffused with brown; lobes obscurely indicated by 5 slight emarginations and 5 aristate points 3 mm. long; densely hairy all over the inner face, the fine hairs up to 3 mm. long arising from small dark-tipped papillae; nerves distinct, 6 to 7 per lobe;

Corona: situated in a small cupular depression of the corolla, 4 mm. in diameter, dark red;

Outer corona: lobes erect, deeply emarginate, broadly connected at the base to the inner corona;

Inner corona: lobes trowel-shaped, incumbent on the anthers, the blunt apices almost meeting.

Type locality: Cape Prov.: British Bechuanaland: Gordonias Distr.: about 90 miles west of Upington, near the South West Africa border, on dark dolerite soil.

Distribution: Not further known.

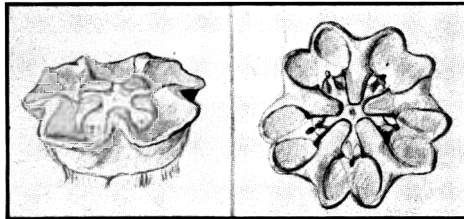


FIG. 1144

Comparison of the coronas of *Hoodia* (right) and *H. rosea* (left)

Miss Cythna

from the Flowering Plant

South Africa

"Lang's Hoodia" was discovered in British Bechuanaland, near the South West Africa border, in April, 1933, by Herbert Lang and E. Schweickerdt. The type is No. 32843 in the Transvaal Museum, Pretoria, and No. 20260 in the National Herbarium. The photograph was taken by Mr. Lang when the plant flowered at the Transvaal Museum in January, 1934.

H. langii has been referred to *H. lugardi*, and its relationship thereto is clearly very close. We believe, however, that it may be considered as an independent species, for the reasons outlined in a letter from Dr. H. G. Schweickerdt:

"I am convinced," he writes, "that *H. langii* is a good species. Examination of the type of *H. lugardi* in the Kew Herbarium has shown that the sepals are about

5 mm. long. Judging from the folding of the corolla in the dried state, I am inclined to believe that *H. lugardi* has a markedly concave corolla. The corolla-lobes furthermore are much longer and more acuminate than in *H. langii* (about 10 mm.!). The pubescence of the corolla in *H. langii* appears to be more conspicuous than in *H. lugardi*'s species. Owing to the crushed state of the corona in the latter, it is hardly possible to get a clear idea of its form, but I am inclined to believe that there is some resemblance between the coronas of the two plants. The color of the corolla in *H. lugardi* is deeper than it is in *H. langii*, and the faint halo so conspicuously present around the corona in *H. langii* appears to be replaced by a dark halo in *H. lugardi*."



PLATE XXXIV.

Hoodia langii Obermeijer et Letty

From the original water color drawing
by Miss Cythna Letty for the Flowering
Plants of South Africa, 1936.

6. *Hoodia husabensis* Nel, sp. nov.

(Description by Dr. G. C. Nel) :

Planta erecta, caespitosa, glauco-viridis; rami glabri, 16-20-costati, spini pungentes, albidus vel nigri. Flores singuli vel 3-4-fasciculati, ad apicem ramorum inserti. Sepala lineari-lanceolata, acuminata. Corolla suborbiculata, leviter sinuata, aristata, roseo-violacea, ad basin papillata, papillae pilis brevibus hispidis obliquis munitae. Corona atro-purpurea; corona exterior cupulaeformis, segmenta subquadrata, bicornuta; corollae interioris segmenta linearia antheris incumbentia.

Plant: 60 to 70 cm. high; stems up to 4 cm. in diameter, with 16 to 20 very prominent ribs, tubercles along the ribs oblong, tipped with very stiff hard whitish or black bristles 7 mm. long;

Flowers: single or in fascicles of 3 to 4 at upper end of the stems;

*Pedice*l: 5 mm. long, glabrous;

Sepals: linear-lanceolate, produced to a fine point, whitish;

Corolla: 7 cm. in diameter, nearly orbicular, slightly showing sinuses between the lobes, tips of the lobes awn-like, 1 mm. long; rose-violet to greyish-violet, with many light colored stripes running radially from the centre to the periphery; papillate around the corona with a circular zone 1 cm. broad of blackish-purple oblong-conical papillae tipped with a short stiffish hair inserted obliquely to the apex;

Outer corona: deep black-purple, cup-shaped, showing definite sinuses where adnate to the inner corona-lobes; lobes subquadrate, with two divergent horns;

Inner corona: deep black-purple; lobes linear, obtuse, incumbent on the anthers and meeting in the centre.

Type locality: South West Africa: Husabkloof.

Distribution: Not further known.

The "Husab Hoodia" was discovered near Husabkloof, South West Africa, in June, 1935, by Dr. Boss. It flowered in February, 1936, in the University Botanical Garden, Stellenbosch, C. P. (No. 6920). The species makes a very interesting addition to the group of *Hoodias* related to *H. lugardi*, being the only member of the group in which the inner corolla surface is papillate only in a restricted area around the corona.

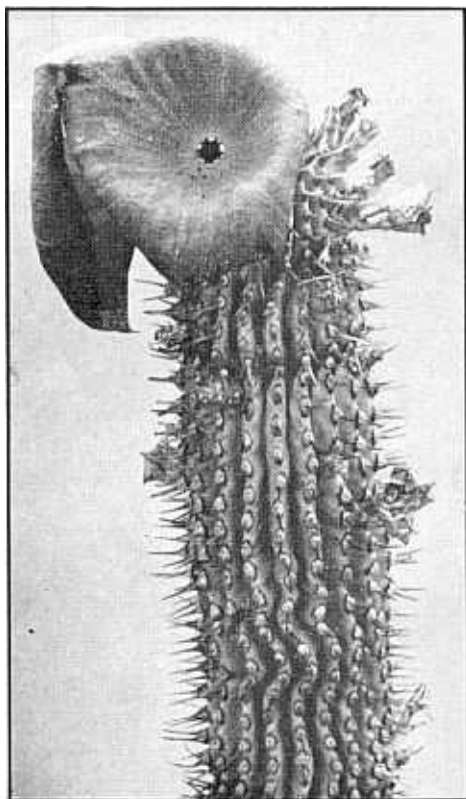


FIG. 1145

Hoodia husabensis Nel x 0.7

Photo by H. Herre.

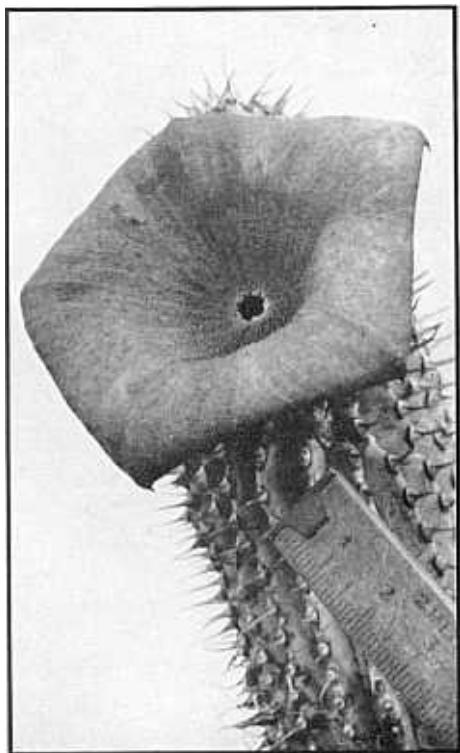


FIG. 1146
Hoodia busabensis Nel x 1
Photo by H. Herre.

7. *Hoodia rosea* Obermeijer et Letty, Flow. Pl. So. Afr., t. 615. 1936.

(Description by Miss A. A. Obermeijer and Miss C. Letty, l.c.):

Plant: about 30 cm. high, branching freely from the base and also above; *stems* 3 cm. in diameter with about 14 tuberculate angles, glabrous, green; tubercles tipped with pale brown spines 4 to 8 mm. long;

Flowers: solitary, situated towards the apex;

Pedicel: 12 mm. long, stout;

Sepals: 3 mm. long, ovate acuminate;

Corolla: 7 cm. in diameter, saucer-shaped, slightly concave in the middle, obscurely pentagonal, with the aristate lobes somewhat recurved; sinuses with a small tooth; shell-pink, thinly hairy all over the inner face with the flattened setae up to $\frac{3}{4}$ mm. long arising from small dark-tipped papillae; nerves very distinct, about 7 per lobe;

Corona: raised above the centre of the corolla, dark purple-brown, 5 mm. in diameter;

Outer corona: of 5 erect truncate lobes with a deep sinus between each and there broadly connected to the inner corona;

Inner corona: lobes oblong, obtuse, incumbent over the anthers but not meeting in the centre, provided with a dorsal gibbosity at the base.

Type locality: Cape Prov.: British Bechuanaland: Gordonian Distr.: near Rietvlei, near the South West Africa border.

Distribution: Not further known.

The "rosy Hoodia" is a lovely species by reason of the beautiful shell-pink color of the flowers and their graceful shape. It is a sister species to *H. langii*, having also been discovered by Herbert Lang and E. Schweickerdt in British Bechuanaland, near the South West Africa border, in April, 1933.

H. rosea may be distinguished from *H. langii* by the shape of the corolla; the more scanty pubescence with shorter, thicker hairs, or rather flattened bristles; the corona raised above the centre of the corolla; the truncate outer corona-lobes, not emarginate; and the dorsal gibbosity at the base of the inner corona-lobes.

It is possible that *H. rosea* might prove to be a natural hybrid between *H. lugardi* and *H. gordonii*. However, the beauty of its coloring and the structure of its corona, so distinctively elevated above the centre of the corolla, are sufficient to maintain it as a species, at least until the entire *Hoodia* genus has been more widely studied.

Prof. Kurt Dinter has paid us a compliment which we very much appreciate in naming for us the handsome *Hoodia* (*H. whitesloaneana* Dinter, sp. nov.), shown in the drawing by Miss Margaret Walker. It was discovered by Ernst Rusch, Jr., on the Kuankib in Great Namaqualand, between Gurub and Tschamis, on Dec. 24, 1934, and the type plant is Prof. Dinter's No. 8272. No complete description has yet

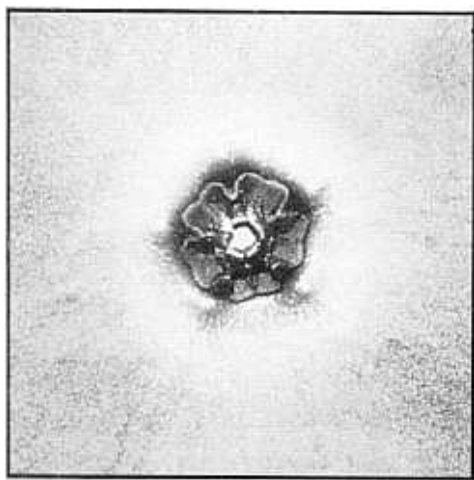


FIG. 1147

Corona of *Hoodia whitesloaneana* Dinter
Photo by Ernst Rusch, Jr.

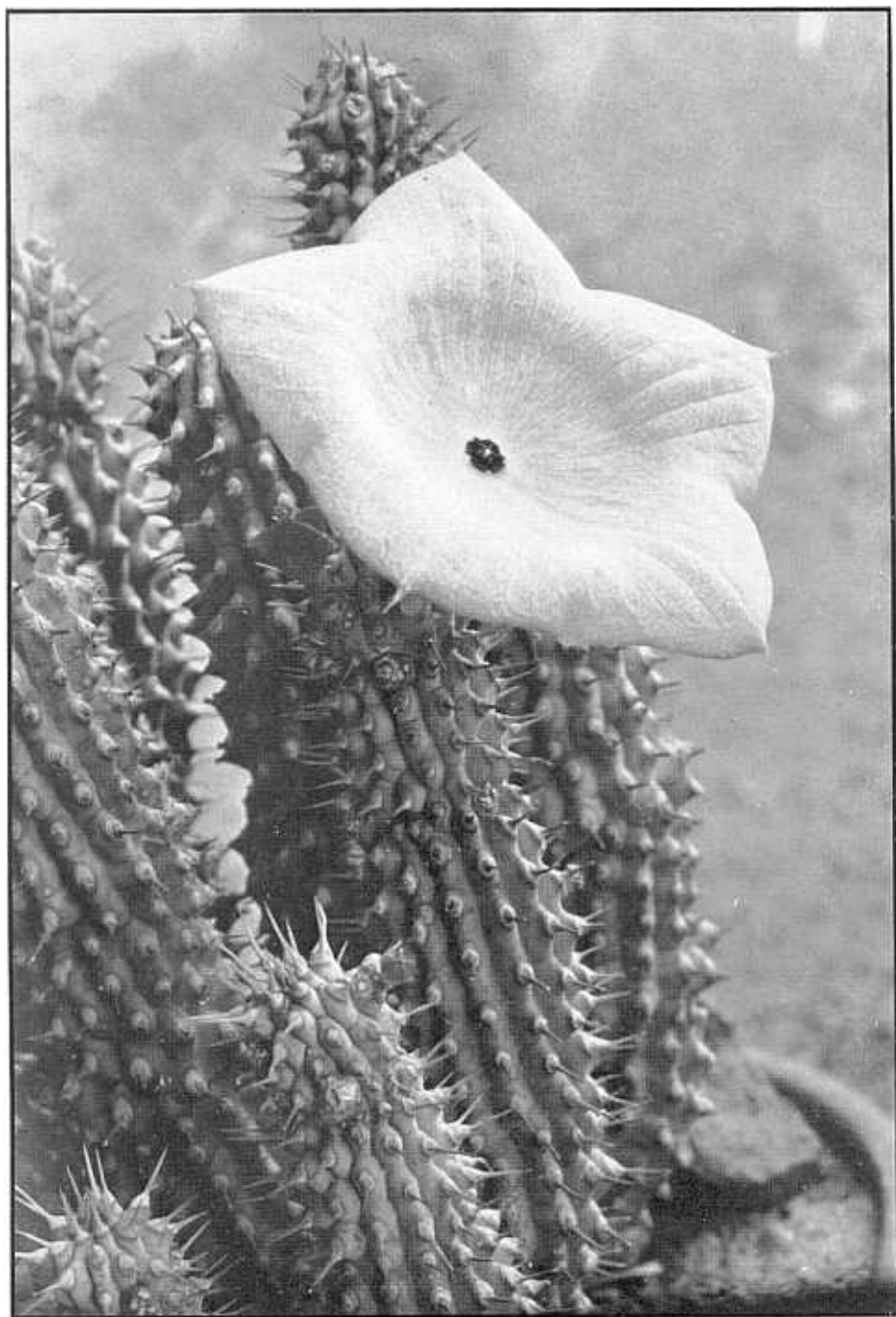


FIG. 1148

Hoodia Obermeijer Letty
Photo by Herbert Lang



PLATE XXXV.

Hoodia rosea Obermeijer et Letty

From the original water color drawing by
Miss Cythna Letty for the Flowering
Plants of South Africa, 1936.

been prepared by Prof. Dinter. The stems appear to be nearly a foot high, and they are unusually slender in proportion to their length. The teeth are capped with very prominent spines. The flowers resemble those of *H. lugardi* in having the inner corolla surface sparingly dotted with microscopic papillae, with fine simple lavender or white hairs at their tips. They differ from *H. lugardi* in their color, which from the dried material appears to be a beautiful lavender-brown, and in the more deeply indented shape of the corolla-lobes. The subulate points of the corolla-lobes are nearly half an inch long, the whole corolla somewhat over three inches in diameter. The corona is a dark purple-brown, with the inner corona-lobes incumbent on the anthers in the conventional manner. The outer corona-lobes are broadly truncate, with a shallow depression at the centre of the apical margin.

Until a more complete description of *H. whitesloaneana* is available, it will be difficult to estimate just how closely its flowers as a whole approach to those of *H. rosea*. The principal distinction between the two appears to lie in the different coloring of their corollas, and in the somewhat more indented corolla-lobes of *H. whitesloaneana* with their longer subulate tips.

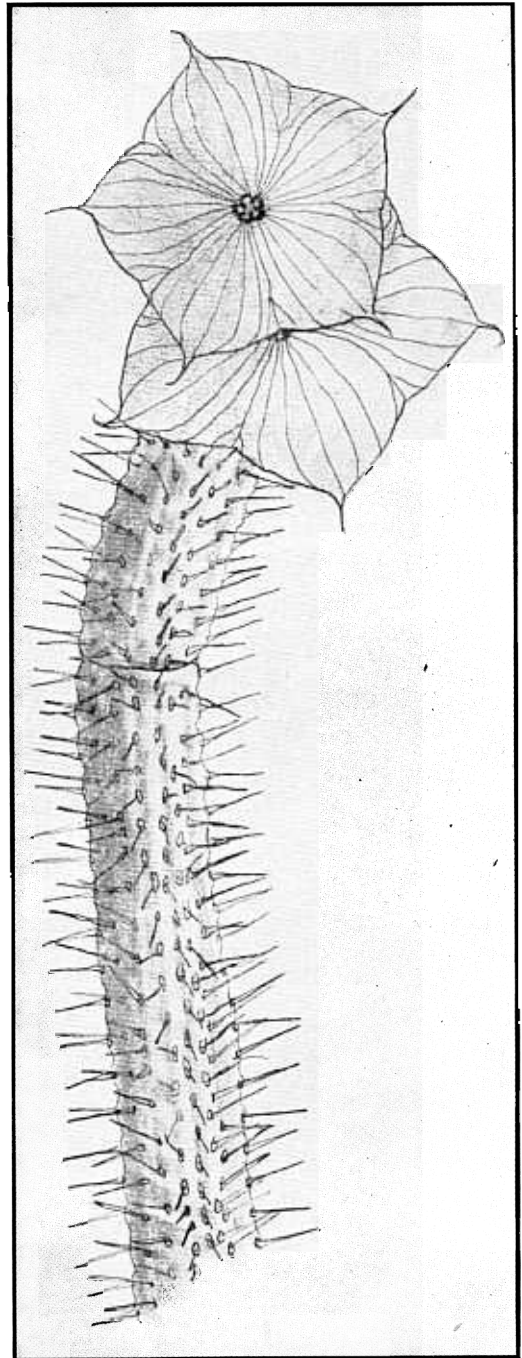


FIG. 1149

Hoodia whitesloaneana Dinter
rawing by Miss Margaret Walker.

8. *Hoodia ruschii* Dinter, Fedde: Repertorium, xxx. 192. 1932.

(Description by Prof. Kurt Dinter, l.c., translated from the German) :

Stems: to 50 cm. high and about 4 cm. thick, with 22 to 24 irregular angles, bearing spines 6 mm. long, broadly cone-shaped at their base;*Flowers*: very numerous;*Pedicel*: only about 4 mm. long, 2 mm. thick, glabrous;*Sepals*: 4 mm. long, 2 mm. broad, acute-lanceolate, glabrous, with even tips (not bent back) ;*Corolla*: broadly campanulate, the radius from centre of corona to tips of corolla-lobes about 20 mm., from centre to the sinuses between the tips 14 mm; tips of corolla-lobes 2 mm. long, the lobes with 5 nerves; inner face red-brown, yellow around the corona, thickly covered all over with papillae, each of which bears at its tip an erect colorless bristle or little hair, $\frac{1}{3}$ to $\frac{1}{2}$ mm. long;*Corona*: not fully known.

Type locality: South West Africa: Great Namaqualand: Tiras Mts., 20 miles north of Aus.

Distribution: Not further known.

Collected in 1931 by Ernst Rusch, Jr., for whom it is named. Prof. Dinter says that it is in some respects related to *Hoodia dregei*, but that the latter differs completely in the covering of dense white hairs on the inner corolla surface.

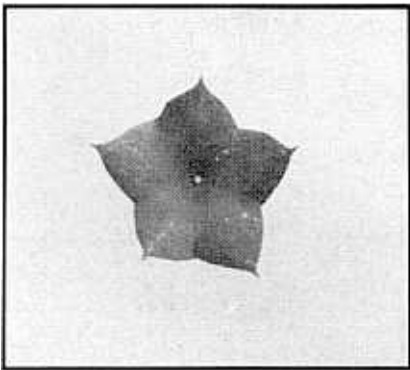


FIG. 1150

Hoodia ruschii Dinter x 0.5

Photo by E. Rusch, Jr.

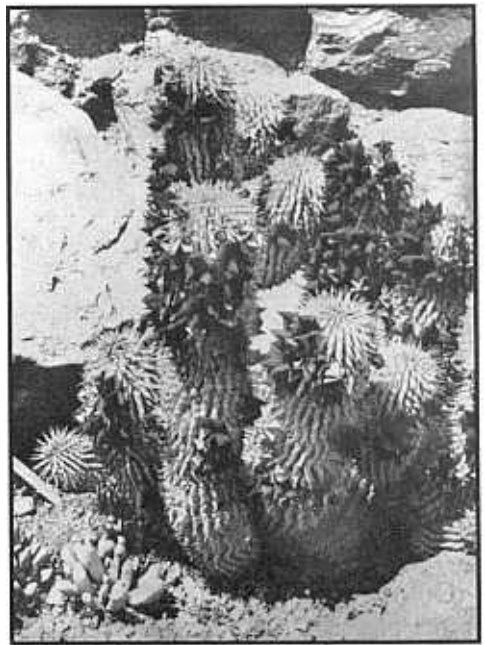


FIG. 1151

Hoodia ruschii Dinter

Photo by E. Rusch, Jr., of a plant from the Tiras Mountains, S. W. Afr.

9. *Hoodia parviflora* N. E. Brown, Kew Bull., 265. 1895.

(Description by Dr. Brown, Flora Trop. Afr., iv. i. 491):

Stems: similar to those of *H. currori*;*Pedicel*: 1 to 2 lin. long, stout, glabrous;*Sepals*: $2\frac{1}{2}$ lin. long, ovate-lanceolate, acuminate, glabrous;*Corolla*: about $1\frac{1}{4}$ in. in diameter, probably concave or cup-shaped, pentagonal or very slightly 5-lobed, glabrous outside, pubescent with hairs $\frac{1}{8}$ to $\frac{1}{4}$ lin. long within; lobes or angles tipped by a subulate point 1 lin. long;*Outer corona*: glabrous; lobes $\frac{1}{2}$ lin. long, concave, bifid to half-way down;*Inner corona*: glabrous; lobes linear, obtuse, incumbent on the backs of the anthers and shorter than them, dorsally connected with the outer corona by a short partition.

Type locality: Angola: Mossamedes: among elevated rocks near Pomangala, 1500 feet.

Distribution: Also in same district: at Quitibe de Baixo and Cavalheiros.

The "small-flowered Hoodia" is well named, for no *Hoodia* has yet been discovered with flowers any smaller. It was discovered by Welwitsch in Angola about 1860 and is only imperfectly known. The corolla is believed to be pale colored outside and darker within, the corona dark brown.

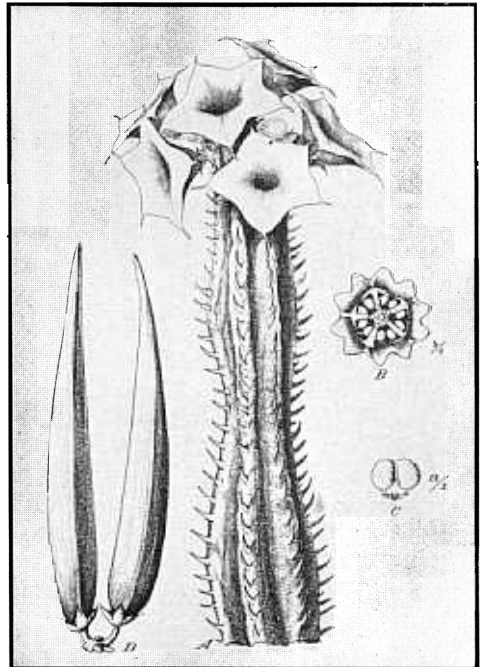


FIG. 1152

Hoodia parviflora N. E. BrownFrom a drawing in Dr. O. Warburg and H. Baum:
The Kunene-Sambesi Expedition, 1903.

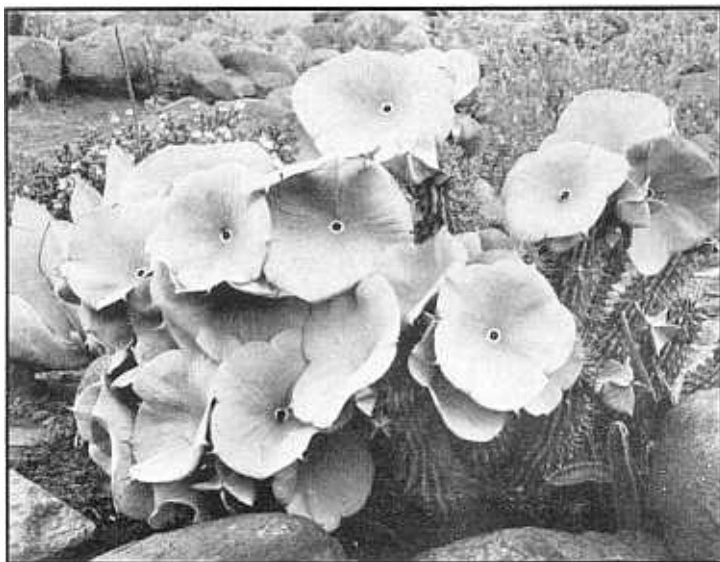


FIG. 1153

Hoodia gordonii Sweet x 0.3

Photo by S. Tapscott.

10. *Hoodia gordonii* (Masson) Sweet, Hort. Brit., 2 Ed., 359. 1830.*Stapelia gordonii* Masson, Stap. Nov., 24. 1796.*Gonostemon gordonii* Sweet, Hort. Brit., 1 Ed., 278. 1827.*Monothylaceum gordonii* G. Don, Gen. Hist., iv. 116. 1838.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 899):

Plant: 1 to 1½ ft. high, with erect *branches* about 2 in. thick, glaucous-green, with the numerous angles beset with slender light brown spines 3 to 4½ lin. long;

*Pedice*l: ½ to ¾ in. long, glabrous;

Sepals: 2½ to 3 lin. long, ovate-lanceolate, acuminate, glabrous;

Corolla: in bud somewhat resembling a narrow pentagonal cone, with 5 very broad wings descending from the short central point to the base, truncate at the top and slightly hooked at the outer angles; when expanded 3 to 4 in. in diameter, subcircular with 5 very broad crenations, each very abruptly tipped with a slender arista-like point 2½ to 3 lin. long, very slightly concave or nearly flat, with or without revolute margins, pale purple, radiately marked with pale greenish-yellow stripes along the veins, thickly sprinkled on the central part with minute dark red papillae, elsewhere quite glabrous, but with a somewhat velvet-like appearance; *tube* very small, about ¼ in. in diameter, just containing the corona, slightly raised around the mouth;

Outer corona: lobes ascending-spreading, somewhat pouch-like at the base, about ⅓ lin. long and ⅔ lin. broad, transversely subrectangular, emarginate or shortly and obtusely bifid at the apex, with inflexed sinuses between them, purple-black, with a shining linear space down the centre of each;

Inner corona: lobes ½ to ⅔ lin. long, linear, obtuse or truncate, incumbent upon the backs of the anthers and not exceeding them, dorsally connected to the outer corona at the inflexed sinuses between the lobes, purple-black;

Follicles: 2½ to 3 in. long, terete, fusiform, tapering to an acute beak, slightly hooked at the apex smooth, glabrous; *seeds* not seen.

Type locality: South West Africa: Great Namaqualand: near the Orange River.

Distribution: South West Africa: Hereroland; Great Namaqualand: Klein Karas Mountains; etc.; Cape Prov.: Little Namaqualand: near Henkries, 12 miles south of the Orange River; and common at other points; Prieska Distr.; Griqualand West.: Herbert Distr.: near Douglas; Mazelsfontein.

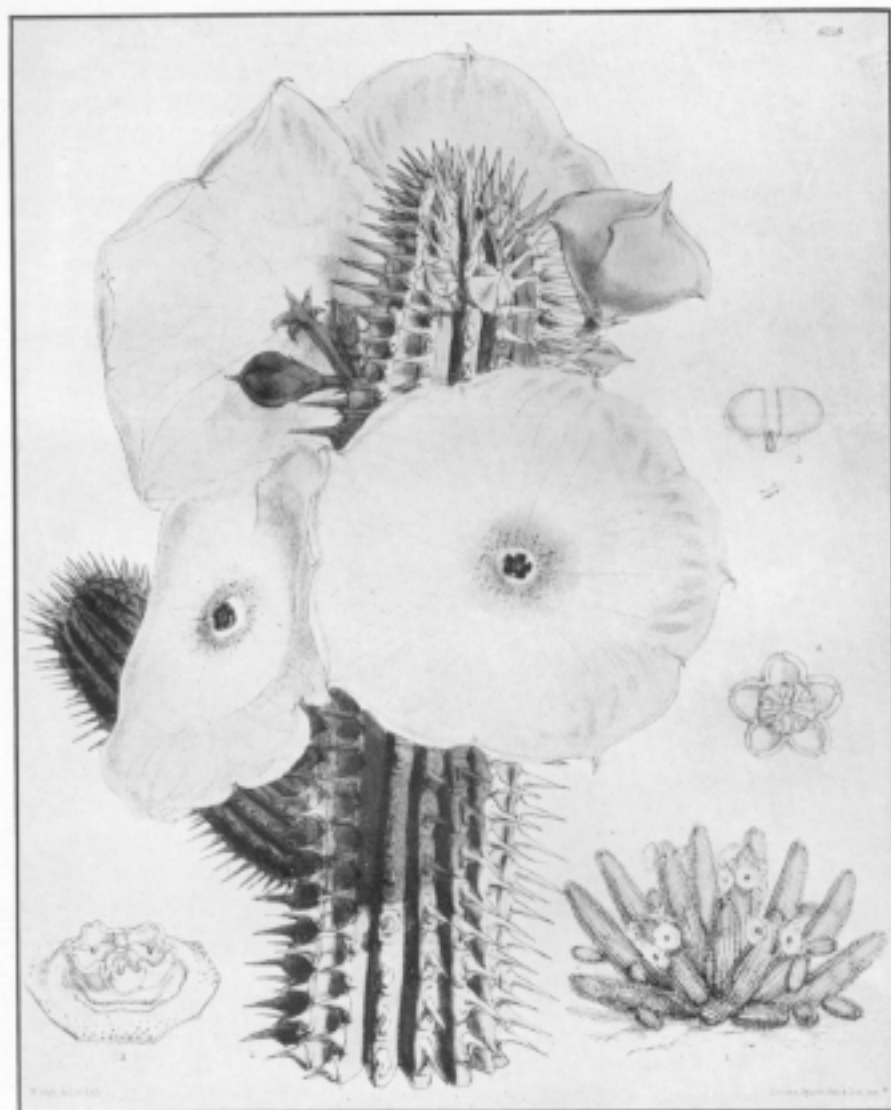


FIG. 1154

Hoodia gordonii Sweet x 0.6

From a drawing by W. H. Fitch in Curtis's Botanical Magazine, 1876. The enlargements in this figure (3 and 4, corona; 5, pollen-masses) represent *Hoodia currori* and not *H. gordonii*.

"Gordon's Hoodia," the type species in the genus, was discovered by Col. R. J. Gordon, who explored the Orange River in 1777 and 1779. He probably collected the

plant in the latter year, in the Great Namaqualand country on the north side of the river. Col. Gordon brought a drawing of it to Francis Masson, who included it in

the *Stapeliae Novae*, 1796, saying it was the only species he had not himself seen. Robert Sweet listed it in the first edition of his *Hortus Britannicus*, 1827, a catalog of plants cultivated in the gardens of Great Britain, but, if it was actually in cultivation at that time, it is not known when or by whom it had been introduced. In his second edition, 1830, Sweet transferred the species to the new genus *Hoodia*. Sir Henry Barkly sent specimens from Little Namaqualand to the Royal Botanic Gardens, Kew, where it flowered in 1875. In recent years it has been found at many points in South West Africa, as far north as Hereroland, and in the Cape Province, from Little Namaqualand to Griqualand West. It

usually grows on rocky slopes or raised and well drained positions, and not in pure sand or low flats. On the low ironstone rises, south-east of Douglas in Griqualand West, the plants form clumps of 15 to 20 stems, nearly two feet in height.

H. gordonii is generally distributed in cultivation. It is a free-blooming and very desirable species, the stems erect, with regular angles fully equipped with slender brown spines. The flowers are gracefully shaped, very slightly concave, pale purple with faint greenish-yellow stripes, hairless, but somewhat velvety in appearance and with the centre of the corolla thickly covered with small dark red papillae.

Hoodia similis Dinter, Sukk.-Forsch. Südwest-Afr., ii. 91 1928.

Type locality: South West Africa: without locality.

Distribution: Not known.

An imperfectly known species, of which hitherto only the name has been published. Presumably the name refers to a close similarity to *Hoodia gordonii*, for Prof. Dinter says, i.e., that on his return to Farm Lichtenstein, near Windhoek, October 1, 1924, he found in flower a plant which he

had previously been growing there and which he had supposed to be *H. gordonii* and was able to identify it as a new species. "It belongs," he adds, "to the hairless *Hoodias* and bloomed so richly that for two weeks it was almost impossible to see even a trace of the stems."

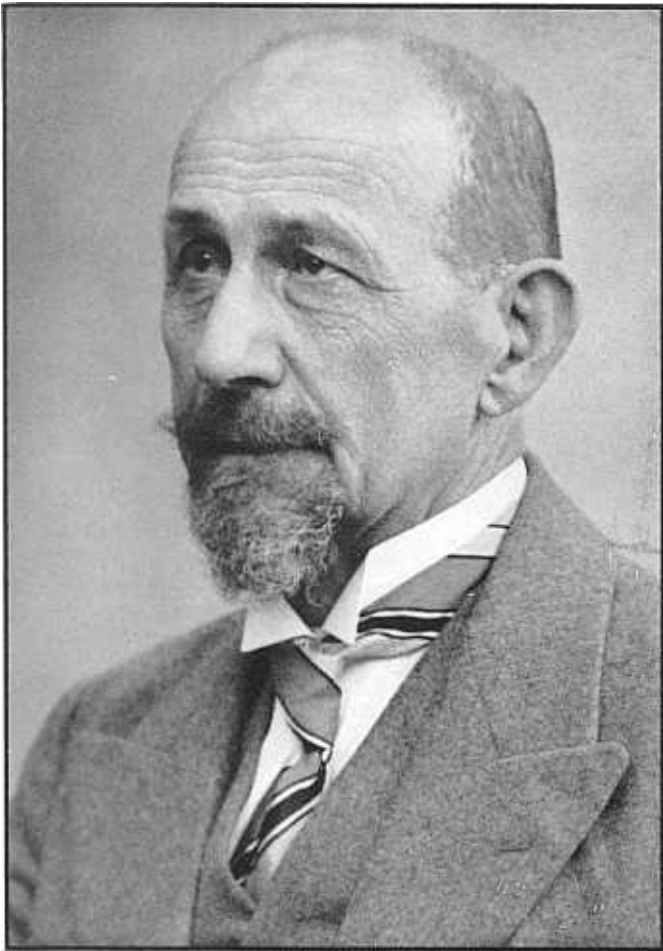


FIG. 1154-A
Prof. Kurt Dinter

11. *Hoodia albispina* N. E. Brown, Flora Cap., iv. i. 900. 1909.

(Description by Dr. Brown, l.c.):

Plant: of unknown size, only one dried branch seen, $4\frac{1}{2}$ in. long and $\frac{3}{4}$ in. thick, but evidently much shrunk in drying, with about 15 tuberculate angles; tubercles tipped with a white spine $2\frac{1}{2}$ to 3 lin. long;

Pedicel: very short, 2 lin. long in the specimen seen;

Sepals: 2 to 3 lin. long, attenuate from a 1 lin.-broad base, glabrous;

Corolla: 3 to $3\frac{1}{2}$ in. in diameter, broadly cup-shaped, about 1 in. deep, with 5 very broad and slight crenations, each abruptly tipped with a subulate or awn-like point $1\frac{1}{2}$ to 2 lin. long, sprinkled and roughened on the central area within with small papillae, otherwise glabrous and smooth;

Corona: apparently slightly exserted from the very small tube, very dark purple-brown;

Outer corona: cupular, with 5 transverse broadly emarginate or notched lobes, $\frac{1}{3}$ to $\frac{1}{2}$ lin. long and 1 lin. broad;

Inner corona: lobes scarcely $\frac{1}{2}$ lin. long, oblong, obtuse, not exceeding the anthers and not nearly meeting at the tips.

Type locality: Cape Prov.: Carnarvon Distr.: Van Wyks Vlei.

Distribution: Not further known.

The "white-spined Hoodia" received its name from the striking color of the spines which tip off the stem tubercles. It was discovered by Captain Alston about 1900 in the central region of the Cape Province, about 50 miles north of Carnarvon. Van Wyks Vlei was the largest early undertaking in irrigation in South Africa. Completed in 1883, it converted an extensive swampy area into a reservoir holding 35 billion gallons of water. But even so great a reserve is insufficient to tide over the long droughts which occur in the region, and xerophytic plants still flourish close by the fields of lucerne and other crops which have been introduced to intensive cultivation.

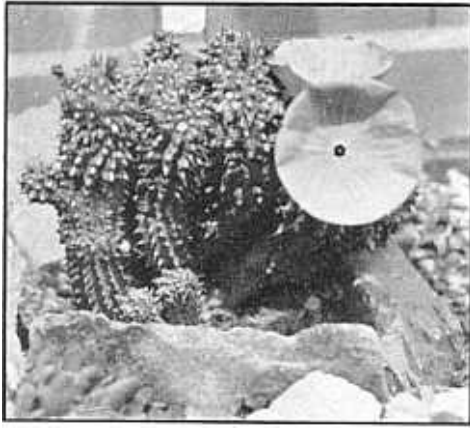


FIG. 1154-B

Hoodia pillansii N. E. Brown

Photo by G. G. Smith of a plant from half-way up the mountain slopes on the Ketting Road, 25 miles from Laingsburg. The flowers are $2\frac{1}{4}$ inches in diameter.

12. *Hoodia pillansii* N. E. Brown, Flora Cap., iv. i. 898. 1909.

(Description by Dr. Brown, l.c.):

Plant: about 5 to 6 in. high, bushily branched; branches 1 to $1\frac{1}{2}$ in. thick, with 15 to 18 tuberculate angles, whitish or glaucous-green; tubercles tipped with a slender brown spine 3 to $4\frac{1}{2}$ lin. long;

Flowers: 1 or 2 together;

*Pedice*l: not seen;

Sepals: 2 to $2\frac{1}{2}$ lin. long, ovate, acuminate, glabrous;

Corolla: about $2\frac{1}{2}$ in. in diameter, apparently concave, with the margin obscurely pentagonal, with 5 awn-like points $1\frac{1}{2}$ to 2 lin. long, rough with small papillae on the central part within, elsewhere smooth and glabrous, "salmon-colored, with the centre a pretty peach-color" (*Pillans*); *tube* in the dried flowers a small cup about 2 lin. in diameter, containing the corona, which in living flowers probably rises to the level of the mouth or beyond;

Outer corona: cupular, 5-lobed, with the lobes about $\frac{1}{4}$ lin. long and $\frac{2}{3}$ lin. broad, truncate, but appearing emarginate in dried flowers from the central part being slightly doubled inwards in the direction of their length, apparently dark purple-brown;

Inner corona: also apparently dark purple-brown, lobes $\frac{2}{5}$ lin. long, oblong-linear, obtuse, shortly exceeding the anthers and slightly crossing each other at the tips.

Type locality: Cape Prov.: Prince Albert Distr.: Grootfontein.

Distribution: Not further known.

In stature "Pillans' Hoodia" is quite the baby of the genus, the next smallest species being *Hoodia triebneri* and *H. juttae*. Its name commemorates its discovery by N. S. Pillans, who found it in the westerly part

of the Great Karroo. The flowers are distinguished by their more deeply concave corolla from the other species which have papillae, at the central part around the corona, not tipped with hairs or bristles.

13. *Hoodia juttae* Dinter, Neue Pfl. Deutsch-Südwest-Afr., 34. 1914.

(Description by Prof. K. Dinter, l.c., translated from the German):

Stems: branching freely, 20 to 25 cm. high, 3 to 5 cm. thick, 14 to 16-angled; the tubercles of the angles tipped with spines, 9 to 11 mm. long, blue-violet when young, becoming dull white with age;

Flowers: 1 to 4 together from the furrows between the angles, near the apex of the stems;

*Pedice*l: glabrous, 1 cm. long;

Sepals: very pointedly triangular, 2 to 5 mm. long;

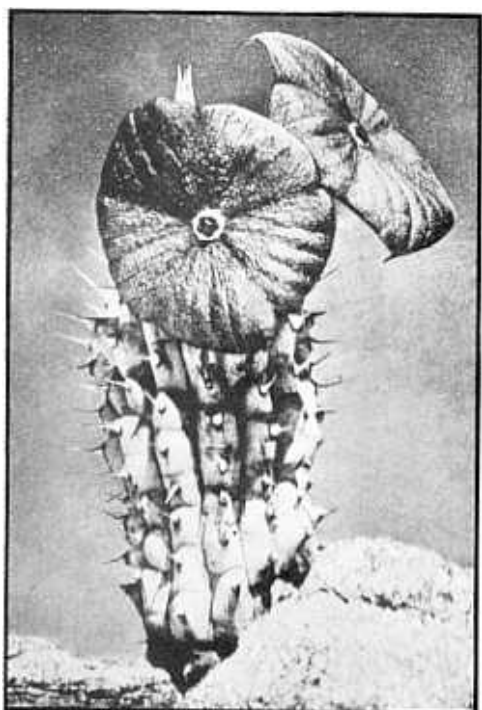
Corolla: quite flat, so it can be pressed without forming any folds, 22 to 55 mm. in diameter, not taking into account the very shallow sinuses and the 2 mm. long tips, circular, glabrous outside and in, outside light yellow-brown, inside greenish-yellow-brown becoming dark red-brown as the flower grows old, veins distinctly marked darker, without a papillate zone around the corona;

Outer corona: of 5 pocket-like lobes, slightly scalloped, dull black-brown;

Inner corona: of 5 broadly spoon-shaped lobes, incumbent on the anthers, frequently overlapping one another at the sides, dull black-brown.

Type locality: South West Africa: Klein Karas Mountains.

Distribution: Not further known.



Discovered by Mrs. Jutta Dinter on a botanical expedition to Klein Karas in October, 1913, and dedicated to her by her husband. This small species, whose stems are only 8 to 10 inches in height, has flowers only an inch in diameter when growing under natural conditions; but in cultivation they develop to twice that size.

FIG. 1155

Hoodia juttae Dinter x 1.

Photo by Prof. Dinter in Neue Pfl. D. S.-W. Afr., 1914.



Carl Luckhoff

PLATE XXXVI.

Hoodia juttae Dinter

From an original water color drawing by Carl Luckhoff.

14. *Hoodia burkei* N. E. Brown, Flora Cap., iv. i. 899. 1909.

Stapelia gordonii Hooker, Lond. Journ. Bot., 164. 1843. *Nec* Masson. 1796.

Scytanthus gordonii Hooker, Icon. Pl., t. 625. 1844.

(Description by Dr. Brown, l.c.):

Plant: more than 1 ft. high, resembling *H. gordonii*; tubercles of the stems tipped with a slender brown spine $\frac{1}{4}$ to $\frac{1}{3}$ in. long;

Pedicel: 4 to 8 lin. long, glabrous;

Sepals: $2\frac{1}{2}$ to 3 lin. long, ovate-lanceolate, acuminate, glabrous;

Corolla: $3\frac{1}{2}$ to 4 in. in diameter, slightly concave or flattish, subcircular, with the lobes very obscurely indicated by 5 very slight emarginations alternating with 5 awn-like points $\frac{1}{4}$ in. long, glabrous and smooth all over, not roughly papillate on the central area;

Corona: equaling or perhaps slightly exserted from the small cup-like tube, apparently dark purple-brown;

Outer corona: cupular, 5-lobed; lobes $\frac{1}{3}$ lin. long, $\frac{3}{4}$ lin. broad, transverse, very broadly notched to about half-way down;

Inner corona: lobes $\frac{1}{2}$ to $\frac{2}{3}$ lin. long, oblong-linear, obtuse, closely incumbent upon the backs of the anthers, broader than and exceeding them and meeting and crossing at their tips, dorsally connected to the inflexed sinuses of the outer corona.

Type locality: Cape Prov.: Beaufort West Distr.: near the Gamka River.

Distribution: Also in Prince Albert Distr.: Willow Fountain.

Discovered by James Burke in the western Great Karroo, while homeward bound from the Transvaal on his journey with Carl Zeyher in 1841. Burke introduced living plants into England and these were first grown in the gardens of the Earl of Derby at his seat of Knowsley, Lancashire; but they have since vanished from cultivation and the species has not been rediscovered. It resembles *Hoodia gordonii*, save that the centre of the corolla is smooth and the spines on the stem-tubercles are more slender and of a different shade of brown. For 65 years the two plants remained confused, until Dr. Brown established "Burke's Hoodia" as an independent species in the Flora Capensis.

H. burkei also very closely parallels *H. bainii*, the principal distinctions suggested by the descriptions of the two plants being that in *H. burkei* the corolla is not as deeply cup-shaped and the outer corona-lobes are more prominently notched. The range of *H. bainii* covers the two points at which Burke and Zeyher collected *H. burkei*, and it seems very possible, as Miss Obermeijer

has suggested to us, that *H. burkei* is simply a form of *H. bainii*.

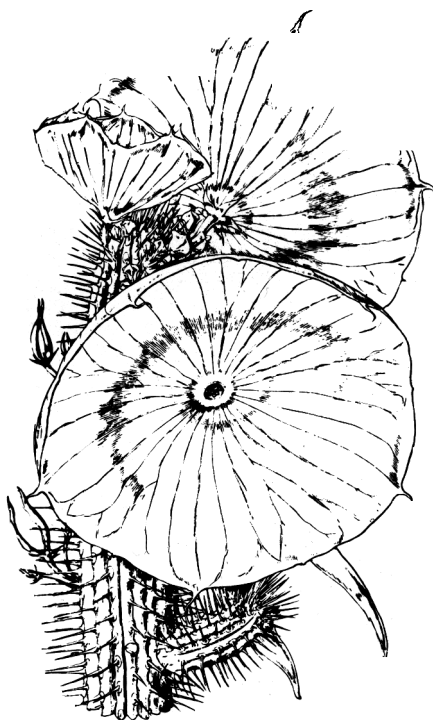


FIG. 1156

Hoodia burkei N. E. Brown x 0.5
From Hooker's Icones Plantarum, 1844.

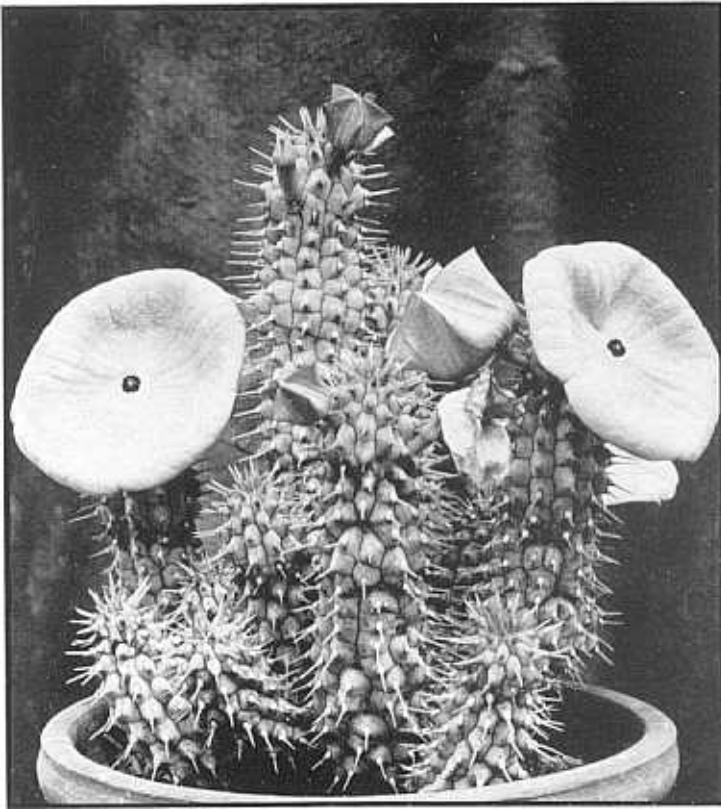


FIG. 1157

Hoodia bainii Dyer x 0.5

Photo by Soldena Gardens.

15. *Hoodia bainii* Dyer, Bot. Mag., t. 6348. 1878.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 897):

Plant: 6 to 8 in. high in the specimens seen (12 to 15 in., *Barkly*), bushily branched; *branches* 1 to 1½ in. thick, with 12 to 15 tuberculate angles, glabrous, green, somewhat glaucous; tubercles tipped with a slender pale brown spine 3½ to 5 lin. long;

Flowers: 1 or 2 together, glabrous in all parts;

*Pedice*l: ¼ to ½ in. long;

Sepals: 2 to 2½ lin. long, ovate-lanceolate, acuminate;

Corolla: in bud hemispheric at the basal part, 5-winged above, truncate, with a short central point; when expanded 2½ to 3 in. in diameter, cup-shaped, about 1 in. deep, subtruncate at the margin with 5 subulate or awn-like points 1½ to 3 lin. long, glabrous, smooth, not papillate on the central part, light yellow or pale buff, sometimes tinged with pinkish or very pale purple; *tube* obsolete, represented by a slight depression from which the blackish corona is exerted or its margin resting upon the rim, when dried contained in a very small cup;

Outer corona: 1¾ to 2 lin. in diameter, cupular, 5-lobed; lobes ¼ to ⅓ lin. long, nearly 1 lin. broad, transverse, emarginate;

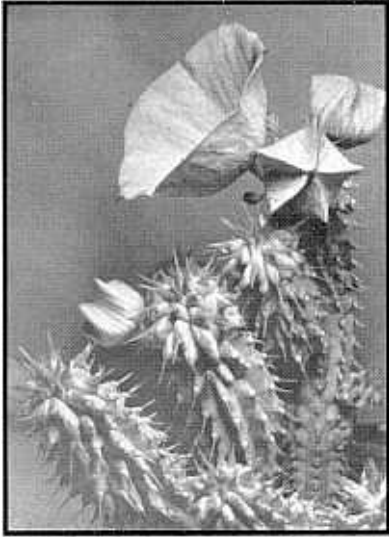
Inner corona: lobes 2/5 lin. long, oblong, obtuse, closely incumbent upon the backs of the anthers and not exceeding them, dorsally connected to the inflexed sinuses of the outer corona;

Follicles: 4 to 5 in. long, 4 to 5 lin. thick, terete-fusiform, tapering to a beak, glabrous, smooth;

seeds 3 to $3\frac{1}{2}$ lin. long, $1\frac{1}{2}$ lin. broad, ovate, flat, with a slightly thickened margin, glabrous, smooth, light brown.

Type locality: Cape Prov.: Prince Albert or Beaufort West Distr.: near Uitskyk.

Distribution: Also in Prince Albert Distr.: near Grootfontein; Carnarvon Distr.: near Van Wyks Vlei; Clanwilliam Distr.: lower slopes, 2 miles west of Doorn River Bridge; Fraserburg Distr.; Kenhardt Distr.: Bushmanland; Griqualand West: Hay Distr.: Asbestos Mountains; South West Africa: Warmbad.



A bushily branched species, whose flowers are more deeply concave or broadly cup-shaped than those of *Hoodia gordonii*. The corolla varies from light yellow to pale buff, sometimes tinged with pinkish or very pale purple. The discovery of the plant is attributed to Thomas C. Bain, for whom it is named, but it may have been collected previously by J. F. Drège. It has a wide range, from the Prince Albert district of the Cape, to Griqualand West and South West Africa.

FIG. 1158

Hoodia bainii Dyer x 0.5

Photo by James West.

Hoodia dinteri Schlechter, Fedde: Repertorium, xviii. 425. 1922.

This species, of which the name only has been published, is perhaps referable here, as Prof. Dinter has said that he considers it to be either *H. bainii* or *H. barklyi*. It was collected in South West Africa. between

Wit Vlei and Mariental, 130 miles east of Windhoek, within the Tropic and 300 miles further north than any other known station of *H. bainii*.

16. *Hoodia barklyi* Dyer, Journ. Linn. Soc., xv. 252. 1876.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 897):

Plant: very much branched, probably not more than 1 ft. high; "main branches nearly 2 in. in diameter, branchlets about 1 in. in diameter, greyish-green" (*Barkly*), in the specimen seen with about 16 angles or series of tubercles, each tipped with a slender brown spine $\frac{1}{4}$ to $\frac{1}{3}$ in. long;

Pedicel: "not above $\frac{1}{8}$ in. long, stout" (*Barkly*);

Calyx: "very small, no bigger than the corona above it" (*Barkly*);

Corolla: in bud 5-winged at the upper half, truncate with a short central point; when expanded about 2 in. in diameter, cup-shaped, $\frac{3}{4}$ in. deep, truncate at the slightly 10-angled margin, with 5 slender points about 1 lin. long, glabrous and smooth outside and within, dull yellow;

Outer corona: lobes deeply bifid, forming 10 equidistant deltoid acuteteeth, "nearly black" (*Barkly*);

Inner corona: "a raised star of 5 strap-shaped rays of a light brown color" (*Barkly*); lobes linear, subacute, broadened at the base and there dorsally connected with the inflexed sinuses of the outer corona.

Type locality: Cape Prov.: "Karoo."

Distribution: Not further known.

The exact habitat of "Barkly's Hoodia" is not known. It was collected in the Karroo by Mr. Lycett of Worcester in 1873 and named for Sir Henry Barkly, who sent an account of it to the Royal Botanic Gardens at Kew in the following year. From the circumstance of Mr. Lycett's residence in Worcester, it has been supposed that the plant was found in that district or in the westerly part of the Karroo, perhaps in Prince Albert district; but it is safe to say that no *Hoodias* are native to the Worcester district, and as to any definite locality elsewhere the evidence is purely negative, as *H. barklyi* has not been rediscovered. Botanically it would be an important species to

know better, as the outer corona-lobes were stated by Sir Henry Barkly to be deeply bifid, and so quite unlike the usual *Hoodia* coronal form.

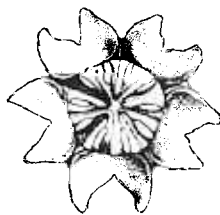


FIG. 1159

Corona of *Hoodia barklyi* Dyer

Showing the deeply bifid outer corona-lobes. From a drawing by W. T. Thiselton-Dyer in Journal of the Linnean Society, 1876.



FIG. 1160

Hoodia triebneri Hans Schuldt in the rock garden of W. Triebner at Windhoek.
In the foreground plants of *Hoodiopsis triebneri* Luckhoff and a species of
Trichocaulon.

***Hoodia triebneri* Hans Schuldt,**
Desert, 92. 1933.

Type locality: South West Africa: without
precise locality.

Distribution: Not further known.

“Triebner’s Hoodia” is a very small species, sharing with *Hoodia pillansii* the claim to be the baby of all the *Hoodias*. The dwarf stems are only 4 to 8 inches tall, with about 12 angles, branching freely. The flowers have not yet been fully described, all we are told being that they “show greenish-yellow and pink colors.” But the photographs indicate that they are very shallowly bowl-shaped, hairless and probably without papillae at the centre of the corolla. The species was discovered in South West Africa by W. Triebner, and it is named for him.



FIG. 1161

Hoodia triebneri Hans Schuldt
Photo by W. Triebner, in Desert, 1933.

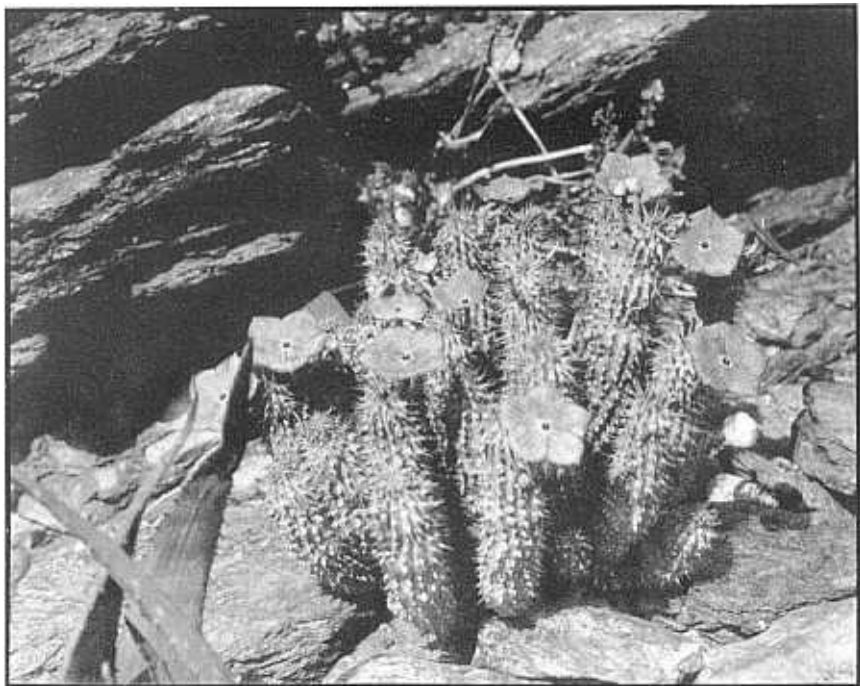


FIG. 1162

Hoodia triebneri Hans Schuldt

Photo by W. Triebner.



FIG. 1163

Hoodia triebneri Hans Schuldt

Photo by W. Triebner.

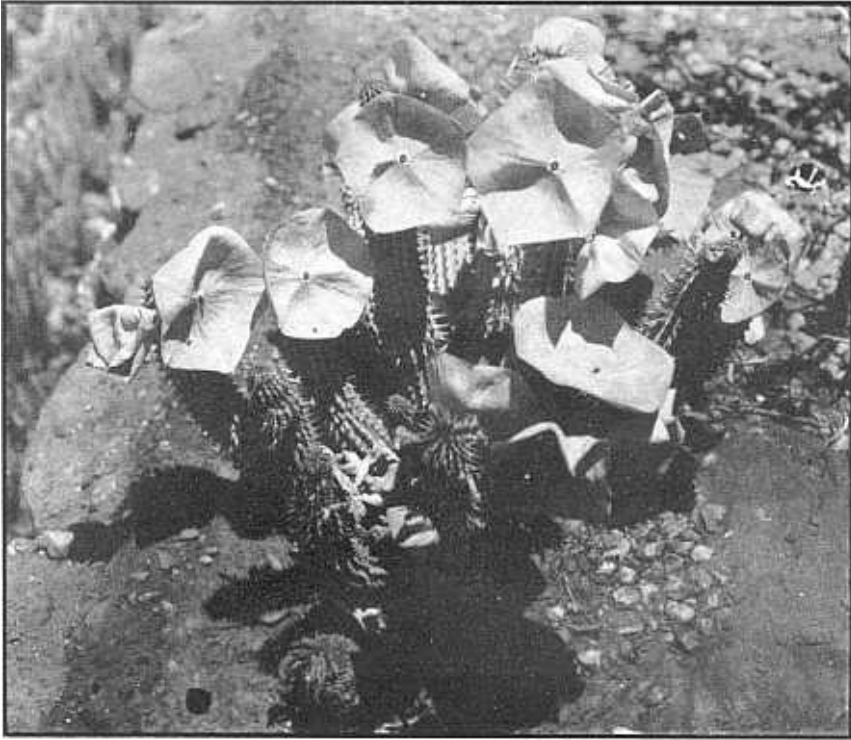


FIG. 1164

Hoodia sp.

Photo by W. Triebner of a plant from the Sinclair Mines, Great Namaqualand. The flowers are 18 to 21 cm. in diameter, with the corolla pink, greenish centre, covered with scattered purple hairs.



FIG. 1165

Hoodia sp.

Photo by W. Triebner of a plant from the Tiras Mountains, Great Namaqualand. It is related to *H. currori*, with deep purple hairy flowers, 15 to 18 cm. in diameter.

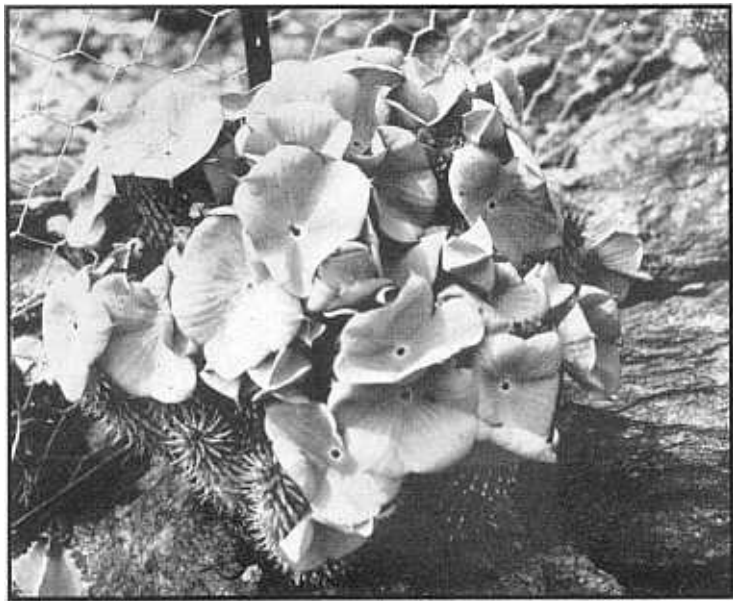


FIG. 1166

Hoodia sp.

Photo by W. Triebner of a plant collected at Blydirerwacht, Great Namaqualand. The flowers are less than an inch in diameter, the corolla pink, with a small circle of orange at the centre.

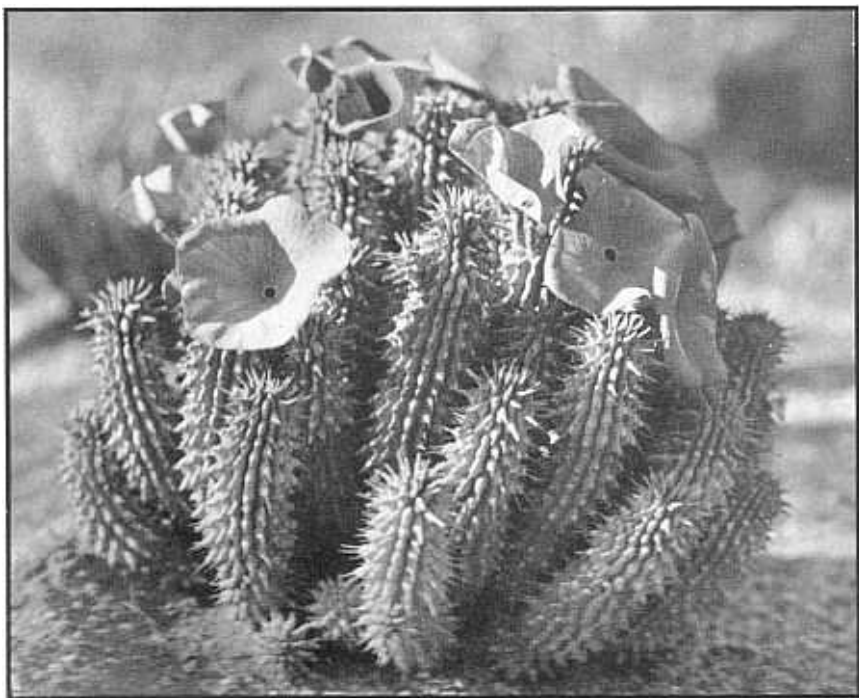


FIG. 1167

Hoodia sp.

Photo by W. Triebner of a plant from Great Namaqualand. The inner corolla surface is greenish-yellow, with purple centre and pink radiating lines.

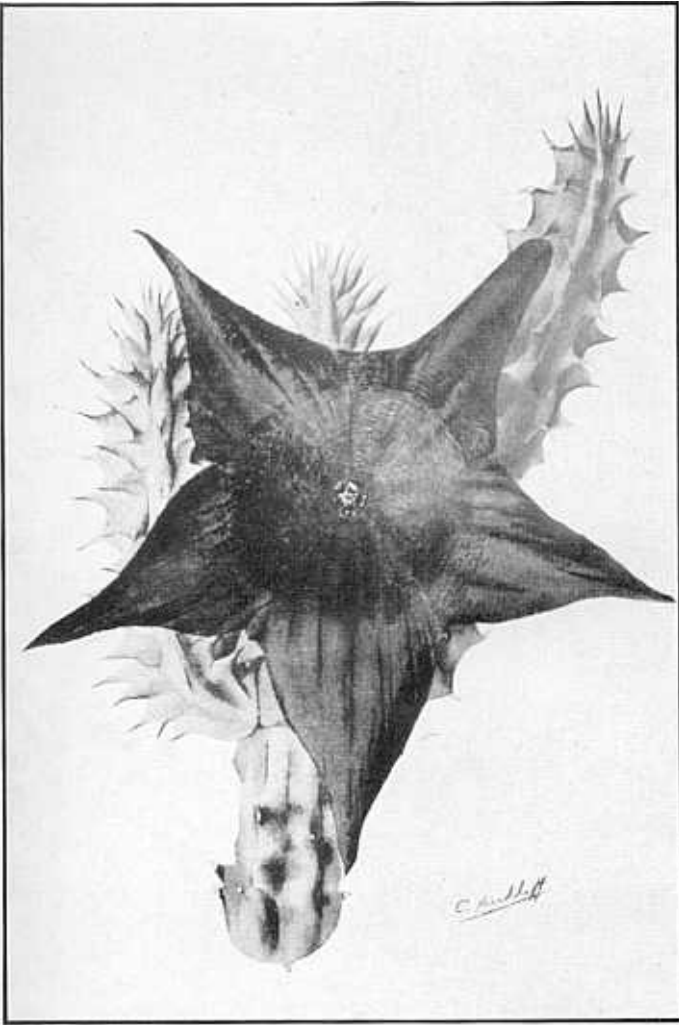


FIG. 1168

Hoodiopsis triebneri Luckhoff
x 0.75

Drawing by Carl Luckhoff, from
South African Gardening and
Country Life, 1933.

HOODIOPSIS Luckhoff, So. Afr. Gard., xxiii. 231 1933.

A monotypic genus, based on the South West African species, *Hoodiopsis triebneri*. It bears traces of having developed from some forgotten hybridization of a *Hoodia* with a *Stapelia* of the *Stapeltonia* section, plus some inheritance from *Caralluma*. It differs from *Hoodia* in the fewer angles of the stems (7 to 9) and in the shape and much greater length of the corolla-lobes. In a way the wide depressed tube at the centre of the corolla suggests kinship to

the *Hoodias*, but the spreading pointed lobes which develop therefrom are altogether reminiscent of the *Stapeltonia* section of *Stapelia*. It differs from *Caralluma* in the 7 to 9 stem angles and in the fact that the inner corona-lobes are 2-horned. Finally it differs from *Stapelia* in the many-angled stems and in having the outer corona-lobes connate at the base with the lobes of the inner corona, quite in the manner of *Caralluma*.

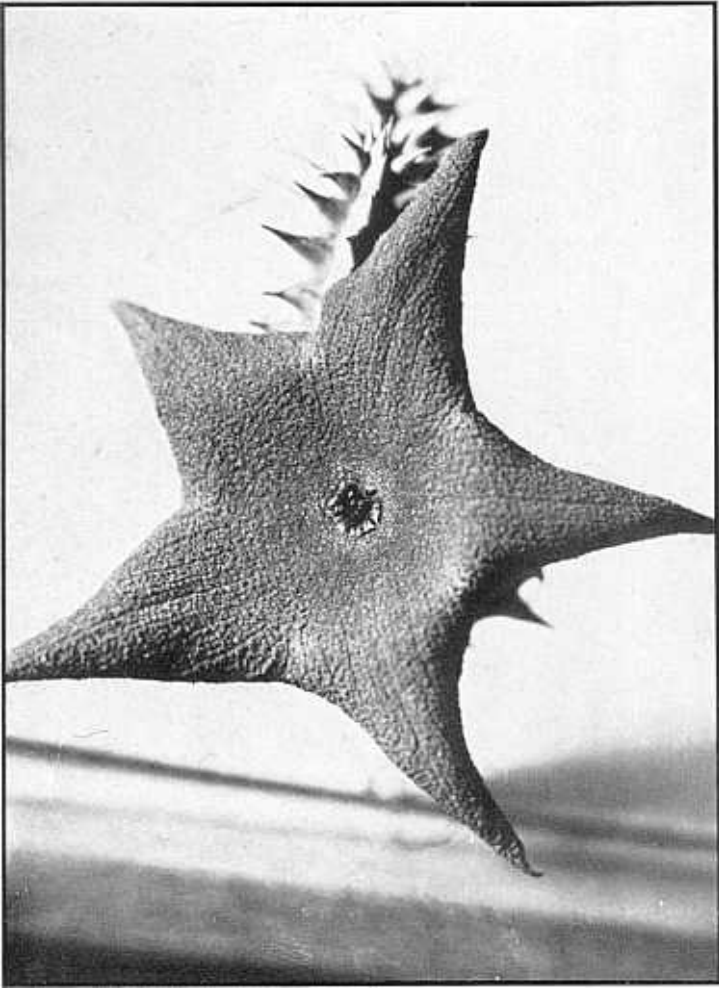


FIG. 1169
Hoodiopsis triebneri Luckhoff x 0.75
 Photo by Carl Luckhoff.

1. *Hoodiopsis triebneri* Luckhoff, So. Afr. Gard., xxiii. 231. 1933.

(Description by C. Luckhoff, l.c.):

Plant: spreading, forming clumps up to 30 cm. in diameter; *stems* erect, branching at the base, 12 to 18 cm. long, 3 cm. thick, deeply 7 to 9-angled, with the angles raised into prominent compressed tubercles, up to 1 cm. long, 7 mm. broad, and attenuate to small indurated teeth, light green, streaked with purple, glabrous;

Flowers: solitary, arising about the middle of the stems;

Pedicel: 2.5 cm. long, terete, light green;

Sepals: 6.5 mm. long, ovate-lanceolate, light green;

Corolla: in bud rhomboid-ovoid, with prominent angles, 3.5 cm. long; when expanded 10.5 cm. in diameter, with a shallow tube 5 cm. in diameter and 5 spreading lobes; outside green or light pink, inside everywhere densely papillate-asperate, with 5 longitudinal sulci and alternate con-

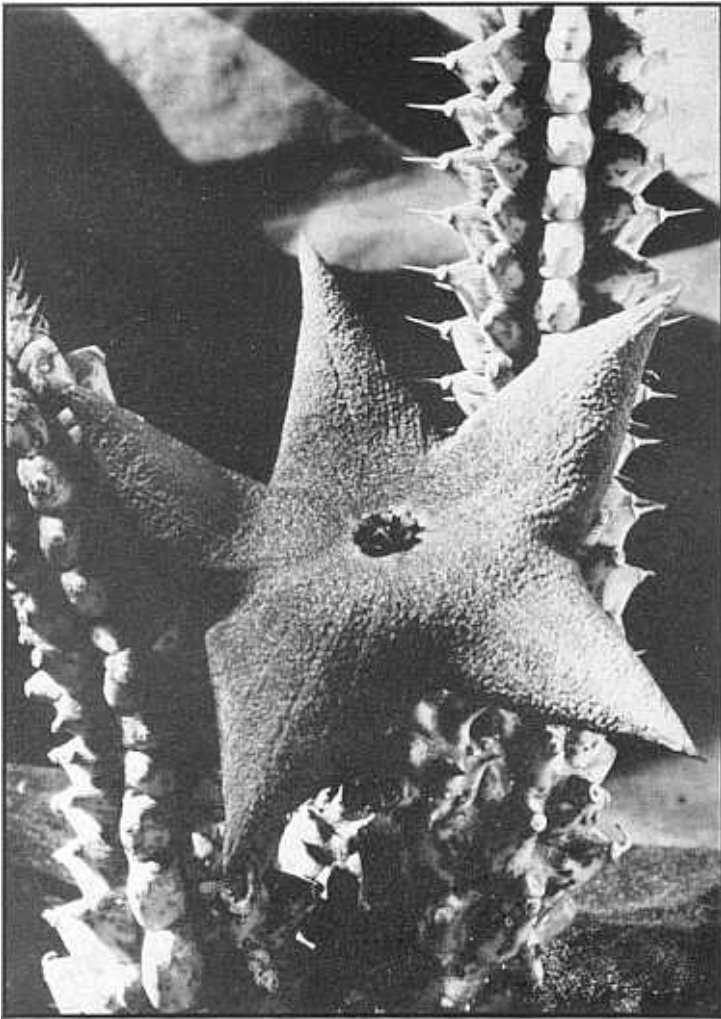


FIG. 1170

Hoodiopsis triebneri var. *ciliata* Luckhoff x 0.75

Photo by Carl Luckhoff.

vexities on the lobes, deep wine-red; lobes 2.5 to 3 cm. long, 3 to 3.5 cm. broad at the base, gradually narrowed from a little below the middle, with the edges recurved;

Corona: double, arising from the staminal column, purple-black;

Outer corona: of 5 erect-spreading entire lobes, 4 mm. long, 2.5 mm. broad at the base and 4.7 mm. at the apex, grooved down the inner face;

Inner corona: 5-lobed; lobes 2-horned; inner horn 3 mm. long, incumbent on anthers, thence connivent-erect or diverging, linear; outer horn 1 mm. long, connected with the adjacent outer corona-lobes near their base;

Staminal column: arising from the base of the corolla-tube; anthers incumbent on the style, subquadrate; filaments free, but connate below.

Type locality: South West Africa: Great Namaqualand, without precise locality.

Distribution: Great Namaqualand: "collected at localities more than 100 miles apart."

Discovered about 1932 by Wilhelm Triebner of Windhoek, for whom it is named. The lesser number of stem angles enables one to distinguish the plant from the *Hoodias*, even before the extraordinary flowers have been seen. There exists a "ciliate variety," which in the natural habitat appears to be of more common occurrence than the type:

Var. a. *Hoodiopsis triebneri* var. *ciliata* Luckhoff, var. nov.

(Description by C. Luckhoff) :

Stems: definitely longer than in the type, and the plant generally of a more robust appearance;

Corolla: inner surface more finely papillate-asperate than in the type; *lobes* a trifle narrower and more attenuate, ciliate;

Inner corona: outer horn of the lobes is reduced in size, sometimes to such an extent as to appear vestigial.

Distribution: South West Africa: Great Namaqualand, without precise locality.

We have proposed the new genus *Luckhoffia* (which we dedicate to Dr. J. Luckhoff of Capetown, and to his son, Mr. Carl Luckhoff, in recognition of their wide services to the study of South African plants in general and of the STAPELIEAE in particular) in order to provide for the species heretofore known as *Stapelia beukmanii*. This species varies in its habit so completely from the other species of *Stapelia*, by reason of its many-angled stems with the angles raised into compressed tubercles surmounted in the young stage by short spines, that on this basis alone we believe it should be separated to constitute a new genus, just as *Trichocaulon* and *Echidnopsis* have been separated from *Caralluma* on the basis of their stem forms only, the coronas and other details of the flower structure in *Trichocaulon* and *Echidnopsis* alike being indistinguishable from the regular *Caralluma* tradition. But in *Luckhoffia* the corona form is altogether distinct from that of *Stapelia*, in that the inner corona-lobes are intergrown at the base with the cup-shaped base of the outer corona between the outer corona-lobes. At first sight *Luckhoffia* may seem related to the genus *Hoodiopsis*, in which the stems also are composed of multiple angles, with the angles raised into compressed tubercles tipped with small indurated teeth. The corolla of *Hoodiopsis*, with its wide central bowl reminiscent of the *Hoodias*, is quite distinct, however, from that of *Luckhoffia*, with its flat limb and very small central cavity lodging the corona; and the coronas in the two plants are even further apart, the inner corona-lobes consisting of a single horn in *Luckhoffia* and of two horns in *Hoodiopsis*. One



FIG. 1171

Luckhoffia beukmanii White et Sloane

Photo by C. Beukman of a plant growing in his rockery at Bonnie Vale, C. P.

might argue that these details of flower structure are not more remote than those separating *Stapelia nobilis* from *S. dummeri* or *S. divaricata* and that if these three plants are all included in the single genus *Stapelia*, so should *Luckhoffia* and *Hoodiopsis* be united into one genus on the basis of their common stem form; but in the case of the *Stapelias* there are innumerable gradations in the flower structure, establishing points of contact which almost form a complete series, whereas *Luckhoffia* and *Hoodiopsis*, each at present known only in a single species, stand so far asunder in

flower structure that they must remain distinct in our opinion, at least until a larger number of intermediate species are discovered.

The genus *Luckhoffia*, as already stated, is monotypic, the only species being native to the Clanwilliam district in the Cape Province.

NOTE: While these pages were in the hands of the printer, we received a very interesting letter from Mr. Luckhoff, bearing on the probable origin of this new genus as a natural hybrid.

"A few weeks ago," writes Mr. Luckhoff, "we visited the locality of *Luckhoffia beukmanii*. The locality was defined to us in great detail by Mr. Beukman, and we found the correct spot. There was, however, not a single plant to be seen, but instead hundreds of specimens of *Hoodias* (not in flower), two species of *Caralluma* (likewise not in flower), and *Stapelia are-nosa* and *S. stultitoides*. The distribution was very closely defined, but though we covered the ground thoroughly not a single plant of *Luckhoffia*, which is very tall and striking and cannot be missed, was found. The conclusion I draw is that *Luckhoffia* is a natural hybrid between a *Hoodia* and either a *Caralluma* or one of the two *Sta-*

pelias mentioned, and that the few plants found by Mr. Beukman, 'less than half-a-dozen in all, were the only ones in existence.'"

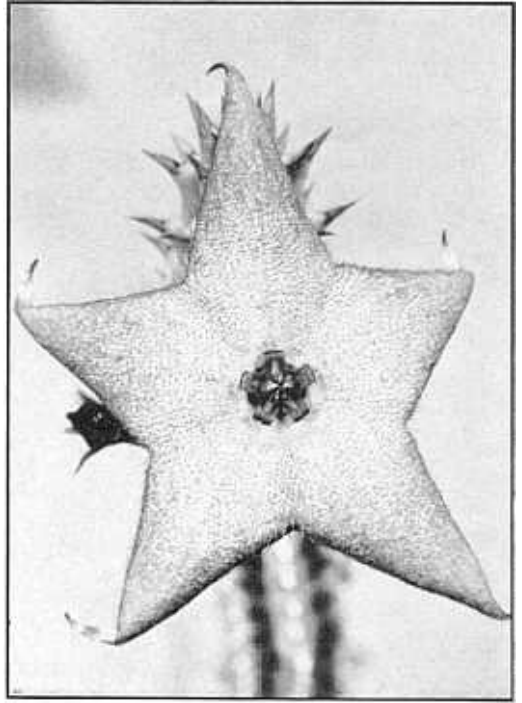


FIG. 1172

Luckhoffia beukmanii White et Sloane

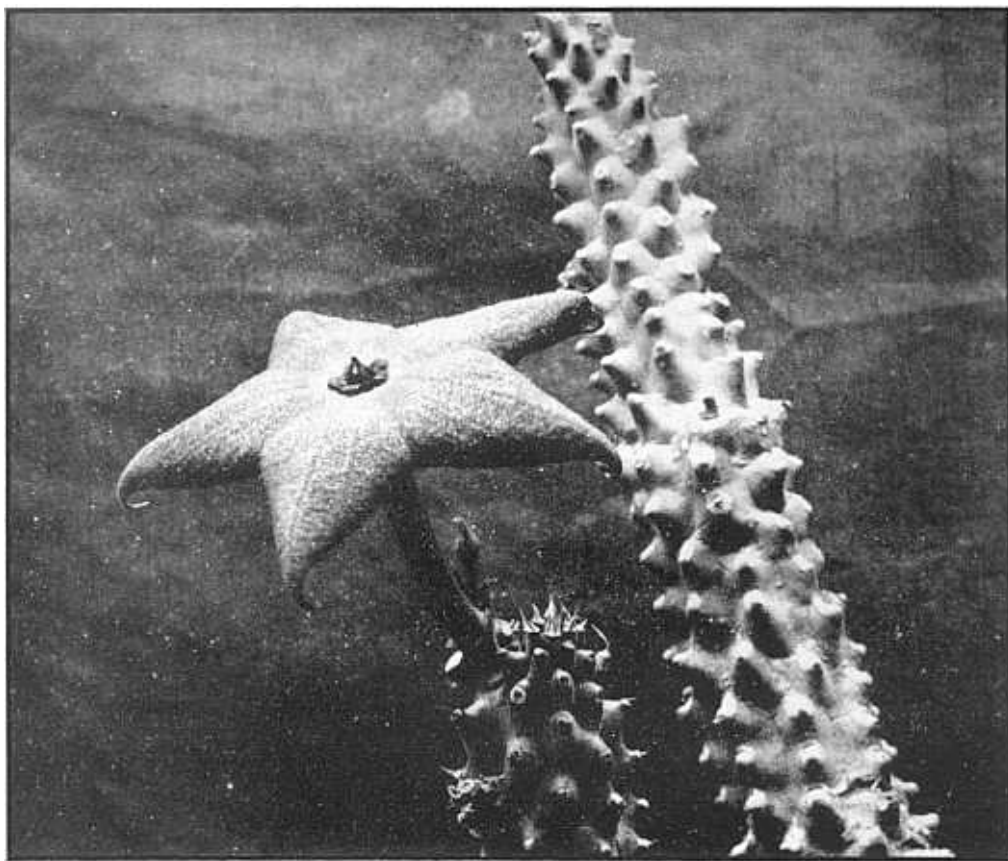


FIG. 1173

Luckhoffia beukmanii White et Sloane x 1.

Photo by Carl Luckhoff, in *South African Gardening and Country Life*, 1934.

1. *Luckhoffia beukmanii* (Luckhoff) White et Sloane, *So. Afr. Gard.*, 36. 1935.

Stapelia beukmanii Luckhoff, *So. Afr. Gard.*, 100. 1934.

(Description by C. Luckhoff, l.c.):

Stems: erect and crowded, branching at the base, up to 75 cm. long, 3 cm. thick, 8-angled, with the angles raised into compressed tubercles, each surmounted in the young stems by a short spine, puberulous, grey-green;

Flowers: in groups of 2 or 3, arising from peduncles at the extremities of the stems;

Pedicel: 3 cm. long, puberulous, light green;

Corolla: when expanded 6 to 6½ cm. in diameter, lobed to half-way down, the united portion flat, with a central cavity lodging the corona, glabrous outside, green or light pink, inside everywhere delicately papillate, the papillae each surmounted by a short horizontal black hair, with three longitudinal ridges on the lobes; united portion and basal half of the lobes brown, spotted with yellow, apical half of lobes uniformly brown; lobes 18 mm. long, 18 mm. broad at the base, with narrow attenuated tips, sparsely ciliate with short black hairs, the edges recurved;

Outer corona: dark purple-brown, lobes 2 mm. long, truncate, recurved and notched at the extremities;

Inner corona: lobes 3 mm. long, linear-lanceolate, incumbent on the anthers and exceeding them, connivent, connected with the outer corona, dark purple-brown.

Type locality: Cape Prov.: Clanwilliam Distr.: in the Pakhuis Mts., on the road between Clanwilliam and Calvinia.

Distribution: Not further recorded.

"Beukman's Luckhoffia" was discovered in 1933 by C. Beukman, schoolteacher and amateur botanist of Bonnie Vale, for whom it was named, in the Pakhuis Mountains, some 25 miles north-east of Clanwilliam on the road to Calvinia. It is one of the most profuse bloomers among all the Stapeliads and enjoys an unusually long flowering season too. At the height of the flowering period, about New Year's Day, a single plant in Mr. Beukman's garden has measured two feet in diameter and as much in stature, bearing probably 50 to 70 flowers, one, two or three at the apex of

each of the 30 or 40 stems. The flowers themselves are about $2\frac{1}{2}$ inches in diameter, the flat disk and the base of the corolla-lobes brown with yellow spots, the upper half of the lobes uniformly brown, the entire inner surface delicately papillate, the papillae tipped with short black hairs and the lobes ciliate with similar hairs. The corona sets in a small central cavity, the outer corona-lobes truncate, recurved and notched at the rim, the inner corona-lobes incumbent on the anthers and then produced above them until the tips meet in an erect bundle.



PLATE XXXVII.

Luckhoffia beukmanii White et Sloane x 1.

From an original water color drawing by Carl Luckhoff.

TAVARESIA Welwitsch, Bol. Cons. Ultr. Lisb., No. 7, 79. 1854.

Decabelone Decaisne, Ann. Sc. Nat., 5 Ser., xiii. 404. 1871.

(Description by Dr. N. E. Brown, Flora Cap., iv. i. 901):

Plants: leafless succulent perennials, branching at the base; *stems* erect or ascending, 6 to 12-angled; angles tuberculate-toothed, each tubercle furnished with 3 bristles;

Flowers: 1 to 4 together at the base of the young stems, successively developed;

Calyx: 5-partite;

Corolla: large, tubular-funnel-shaped, 5 lobed; *lobes* valvate in bud, the sinuses between them forming acute projecting angles;

Corona: double, arising from the staminal column;

Outer corona: shortly tubular at the base, then divided into 10 long filiform segments, each terminated by a knob, and usually with a minute tooth between the pairs of segments that alternate with the anthers;

Inner corona: of 5 narrow lobes incumbent upon the backs of the anthers and dorsally connected with the basal part of the outer corona by short partitions;

Staminal column: arising from the base of the corolla; *anthers* ovate-oblong, without appendages, incumbent upon the top of the style; *pollen-masses* solitary in each anther-cell, horizontal, rather large, compressed, pellucid-margined along one side, attached in pairs by short caudicles to subulate lateral processes from the pollen-carriers; *style* not exceeding the anthers, flat and pentagonal at the apex;

Follicles: produced in pairs, somewhat diverging, narrowly lanceolate-fusiform, smooth; *seeds* rather small, crowned with a tuft of hairs;

Type species: *Tavaresia angolensis*.

Total species: 3.

Distribution: Angola, South West Africa, Bechuanaland Protectorate, Southern Rhodesia, Transvaal, Orange Free State and Cape Province.

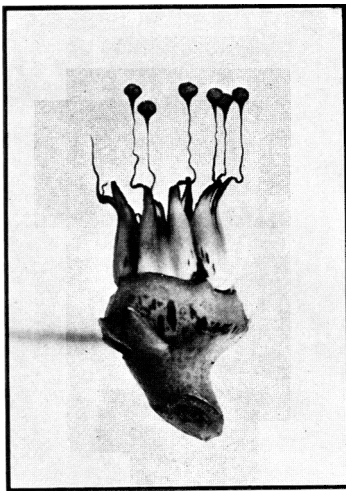


FIG. 1174

Outer corona of *Tavaresia grandiflora* Berger x 2.

The terminal knobs, which normally hang down, have been turned up to show better.

Tavaresia is a genus comprising three species, widely distributed in Tropical and South Africa. The many-angled stems of the *Tavaresias* are distinguished from those of other genera by having the tubercles along the angles each tipped with three bristles. The flowers have a tubular funnel-shaped corolla, the "thimbles" ranging in length from 2 to 6 inches. A synonym for one species is *Stapelia digitaliflora*, or the "Stapelia with flowers like the foxglove," which is very descriptive. Within their deep throat the flowers shelter a complex and very beautiful outer corona. Its lobes are intergrown at the base in a sort of broad erect collar, each lobe dividing higher up into two long tapering segments, with sometimes a short tooth between. Near their tips the segments are almost thread-

like, and hang down, ending in little pendulous terminal knobs. The inner corona is in the conventional *Caralluma* tradition.

The genus was established by Fr. Welwitsch in 1854, to provide for *Tavaresia angolensis*, a species he had discovered the preceding year in Angola. In 1871 Decaisne redescribed the plant under the new generic name, *Decabelone* (meaning "ten needles"), and this remained in current use until 1904, when Dr. Brown in the *Flora of Tropical Africa* restored the earlier name. Welwitsch dedicated the genus to José Tavares de Macedo, a superior official in the Portuguese Ministry of Marine and

the Colonies. It was through the Marquis de Sá da Banderia, Minister in this department of the government, that Welwitsch received the appointment to his mission to Angola. Tavares, the assistant to the Marquis, was an amateur student of distinction in botany and a member of the Royal Academy of Sciences of Lisbon.

The three species of *Tavaresia* are so closely allied that one might well consider them all as subspecies of a single norm. It may be that their resemblances have been heightened by hybridization under cultivation, or that intermediate forms between the species exist.

Stems: The descriptions assign 6 or 8 stem angles to *T. angolensis*; 10 or 12 to *T. barklyi*; and about 14 to *T. grandiflora*. While these differences are customary, there are exceptions. In particular we have found stems of *T. grandiflora* with only 8 angles.

Bristles: The two lateral bristles on the stem tubercles of *T. angolensis* curve upwards; in *T. barklyi* and *T. grandiflora* they are deflexed or else project horizontally. Dr. Phillips differentiates the color of the bristles, which he describes as purple in *T. barklyi*, whereas they are given as whitish in *T. angolensis* and white in *T. grandiflora*.

Flowers: The color scheme is virtually the same in all species; their size varies materially, being in general very much larger in *T. grandiflora*.

Outer corona knobs: Some confusion exists regarding the shape of these. In *T. grandiflora* Berger defines them as pear-shaped or clavate; Dr. Phillips calls them globose. In *T. barklyi* all the descriptions state them to be globose. In *T. angolensis* they are called pear-shaped. We have found them very similar in plants we believe to be related to all three species, in each case being tear-shaped rather than exactly globose or accurately pear-shaped.

Outer corona teeth: The presence of a small tooth between the segments of the outer corona-lobes is stated by Dr. Brown to be *usual* in his description of the genus, and this may refer to all species. However, this feature is mentioned specifically only in the case of *T. grandiflora*, and we have noticed it only in that plant.

KEY TO THE GENUS TAVARESIA

- I. Stems with 6 to 8 angles; lateral bristles on tubercles curved upwards

II. Stems with 10 or more angles; lateral bristles on tubercles deflexed or horizontal:

A. Corolla-tube about 1½ in. long

B. Corolla-tube about 4 in. long

1. *T. angolensis*.

2. *T. barklyi*.

3. *T. grandiflora*.

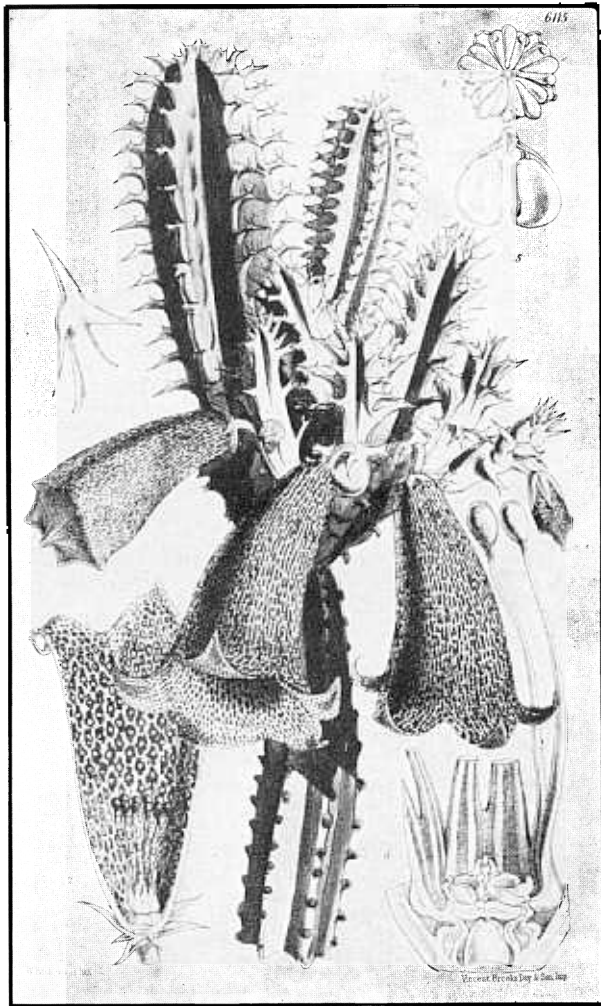


FIG. 1175

Tavaresia angolensis Welwitsch x 0.8

From a drawing by W. H. Fitch, in Curtis's Botanical Magazine, 1874.

1. *Tavaresia angolensis* Welwitsch, Bol. Cons. Ultr. Lisb., No. 7, 79. 1854.

Huernia tavaresii Welwitsch, Bol. Cons. Ultr. Lisb., No. 24, 252. 1856.

Decabelone elegans Decaisne, Ann. Sc. Nat., 5 Ser., xiii. 404. 1871.

Stapelia digitaliflora Pfersdorf, ex Decaisne: Ann. Sc. Nat., 5 Ser., xiii. 405. 1871.

Decabelone sieberi Pfersdorf, Bot. Mag., t. 6115. 1874.

(Description by Dr. N. E. Brown, Flora Trop. Afr., iv. i. 493):

Plant: glabrous in all parts; *stems* $2\frac{1}{2}$ to 5 in. high, fleshy, leafless, 6 (rarely 8)-angled; angles with conical tubercles $1\frac{1}{2}$ to 2 lin. long terminated by 3 whitish bristles; central bristle horizontal, two lateral much shorter and curved upwards;

Flowers: few, in sessile cymes;

Pedicel: $\frac{1}{2}$ in. long;

Sepals: $3\frac{1}{2}$ to 4 lin. long, lanceolate, acuminate;

Corolla: smooth (or minutely and sparsely scabrid-tuberculate) outside, densely papillate within, pale yellowish, spotted inside and out with purple-red; *tube* $1\frac{1}{2}$ to 3 in. long, 1 to 2 in. in diameter; *lobes* $\frac{1}{2}$ to $\frac{3}{4}$ in. long, spreading, deltoid, acute;

Outer corona: 7 to 9 lin. long, shortly tubular at the base, divided into 10 filiform segments, ending in pendulous pear-shaped orange-brown knobs, the other parts similar in color to the corona of *T. barklyi*;

Inner corona: lobes about $\frac{3}{4}$ lin. long, linear-attenuate, incumbent on the backs of the anthers and scarcely longer than them, dorsally connected to the outer corona by short partitions, dark purple-brown;

Seeds: 2 to $2\frac{1}{2}$ lin. long, $1\frac{1}{2}$ lin. broad, ovate, plano-convex, with a broad thick border, glabrous, smooth, light brown.

Type locality: Angola: near Luanda.

Distribution: Recorded from several points along the coast of Angola, from Luanda north to Ambriz.

The "Angola *Tavaresia*" may be most easily differentiated from its two congeners by the character of its stems. They have only 6 to 8 angles; the angles are more pronounced and the lateral bristles on the tubercles curve upwards. The plant grows within the city limits of Luanda and thence northerly along the coast as far as Ambriz. "It is an insignificant little succulent," Mr. Gossweiler writes us, "and at the height of the dry season it assumes the color of the

soil in which it grows. It is much disseminated in the pasturage, sporadic amongst the short grass and herbs on the hills facing the Atlantic. The flower and fruit are taller than the stems. It is found within a mile of the sea, but not beyond this. Its cultivation has been attempted in the Luanda gardens, but without success; it always dies after being transplanted, and yet the books speak of cultivated specimens."

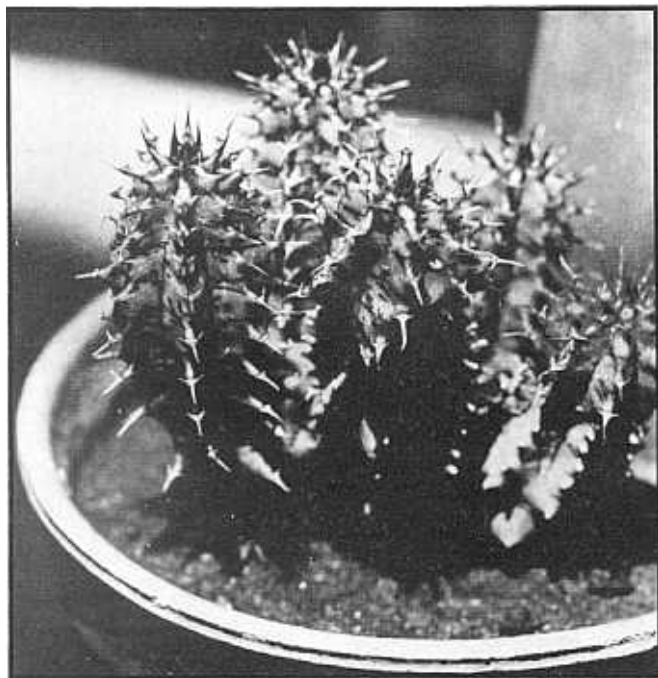


FIG. 1176

Tavaresia angolensis Welwitsch

Photo by G. C. Nel, showing the difference in the stems from those of the other two species of *Tavaresia*.

2. *Tavaresia barklyi* (Dyer) N. E. Brown, *Flora Trop. Afr.*, iv. i. 494. 1904.

Decabelone barklyi Dyer, *Bot. Mag.*, t. 6203. 1875.

(Description by Dr. E. P. Phillips, *Flow. Pl. So. Afr.*, t. 475. 1932):

Stems: bluish-green, 4 to 7 cm. high, $1\frac{1}{2}$ cm. in diameter, cylindric, 10 to 12-angled, glabrous; angles closely set with white tubercles, each tubercle terminated by 3 purple bristles; lateral bristles diverging; central bristle horizontal or ascending;

Flowers: 1 to 4, arising from the base of the young stems, opening successively;

*Pedice*l: 5 mm. long;

Sepals: 6 mm. long, 2 mm. broad at the base, ovate-lanceolate, acuminate, 3-lobed with the 2 lateral lobes smaller than the middle lobe;

Corolla: unevenly spotted and marked with dark red spots or stripes without, pale yellow and spotted with dark red within, entirely purple at the base of the tube; *tube* $3\frac{1}{2}$ cm. long, 2 cm. wide at the mouth, slightly constricted on the underside at about the lowermost third; *lobes* $1\frac{1}{2}$ cm. long, $1\frac{1}{2}$ cm. broad at the base, ovate, long-acuminate;

Outer corona: lobes connate, each lobe produced into two long thread-like appendages about 7 mm. long, each appendage with a terminal globose knob;

Inner corona: lobes joined at the base to the outer, appressed over the anthers, $1\frac{1}{2}$ mm. long, linear-lanceolate.

Type locality: Cape Prov.: Prieska Distr.: Karroo, by the Orange River.

Distribution: Also from Richmond Distr.: Karroo, near Richmond Road Station; Colesberg Distr.: near Colesberg; Kenhardt Distr.: Hopetown Distr.: near Hope-town; Strydenburg; British Bechuanaland: Gordonia; Little Namaqualand: between Koper Berg and Kookfontein; Griqualand West: Kimberley Distr.: near Kimberley; Herbert Distr.: Douglas; Mazelsfontein; Hay Distr.: Postmasburg; Orange Free State: Smithfield Distr.: Farm Springbokfontein; Fauresmith Distr.: kopje near Koffiefontein; Philippolis Distr.: near Luckhoff.

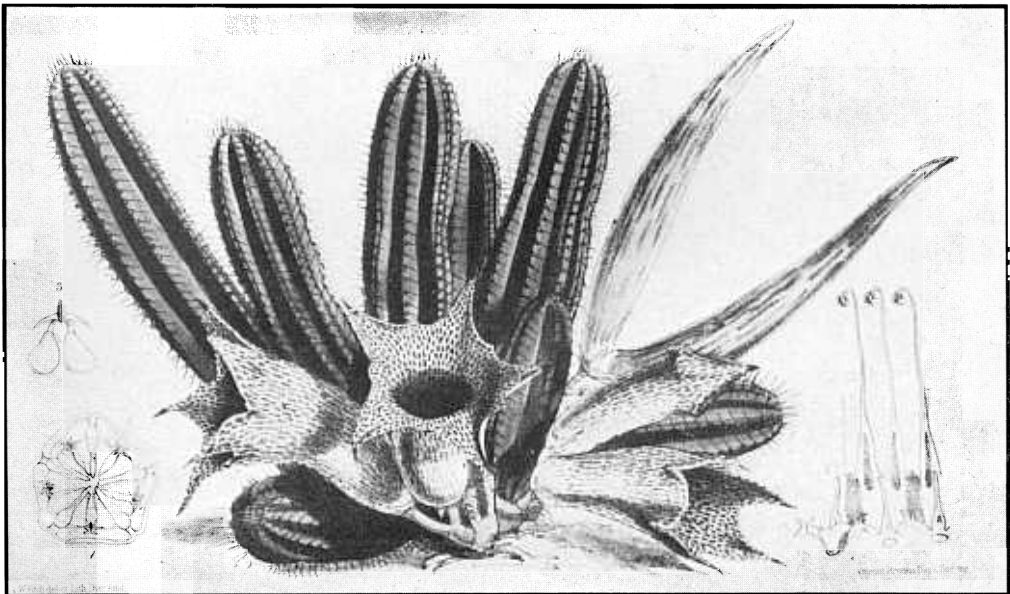


FIG. 1177

Tavaresia barklyi N. E. Brown x 1.

drawn by W. H. Fitch, in Curtis's Botanical Magazine

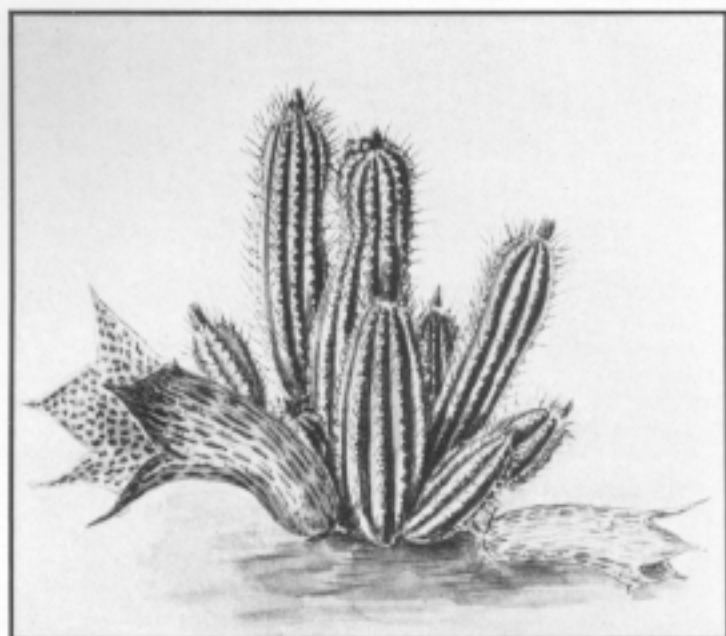


FIG. 1178

Tavaresia barklyi N. E. Brown x 1.

From the original water color drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1932.

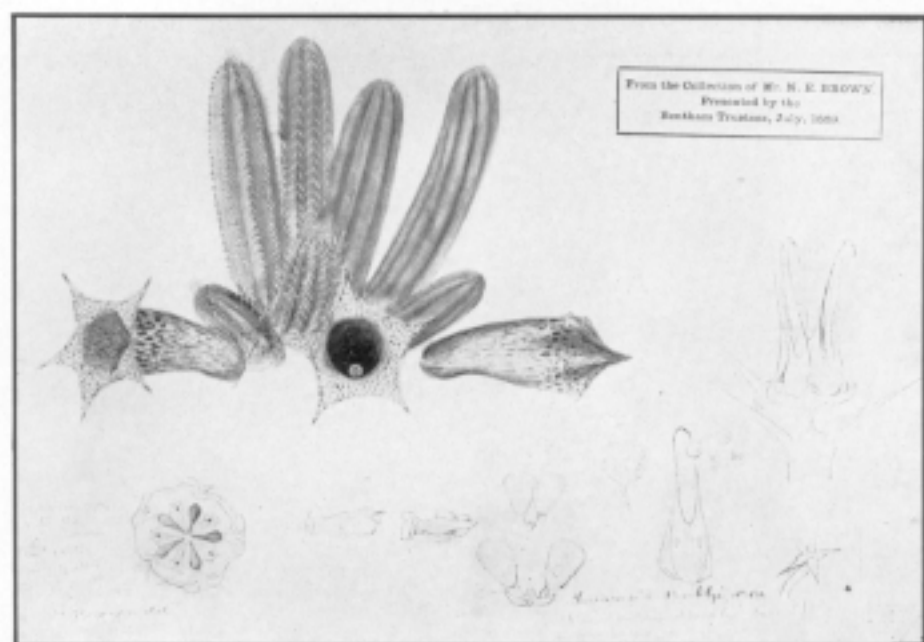


FIG. 1179

Tavaresia barklyi N. E. Brown x 0.75

Drawing by N. E. Brown. Reproduced by permission of the Bentham Trustees.

"Barkly's *Tavaresia*" was first collected by Dr. Lichtenstein at a point along the Orange River near Prieska in July, 1805. It was rediscovered by Sir Henry Barkly in 1871 in the Karroo, near Colesberg, and is named for him. It has an extended range of 500 miles or more, usually selecting more or less protected positions on kopjes and rocky slopes, often with an eastern aspect. It is supposed to be native also in the tropi-

cal part of South West Africa, but the records there may refer to the much-confused *Tavaresia grandiflora*. Should this prove to be the case, *T. barklyi* will be known only from localities south of the tropics. It may be differentiated from *T. angolensis* in having the lateral bristles on the stem tubercles deflexed or diverging instead of curved upwards; and from *T. grandiflora* through its very much smaller flowers.

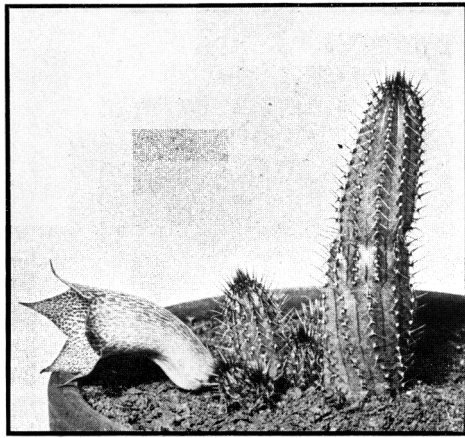


FIG. 1180
avaresia barklyi N. E. Brown x 0.8

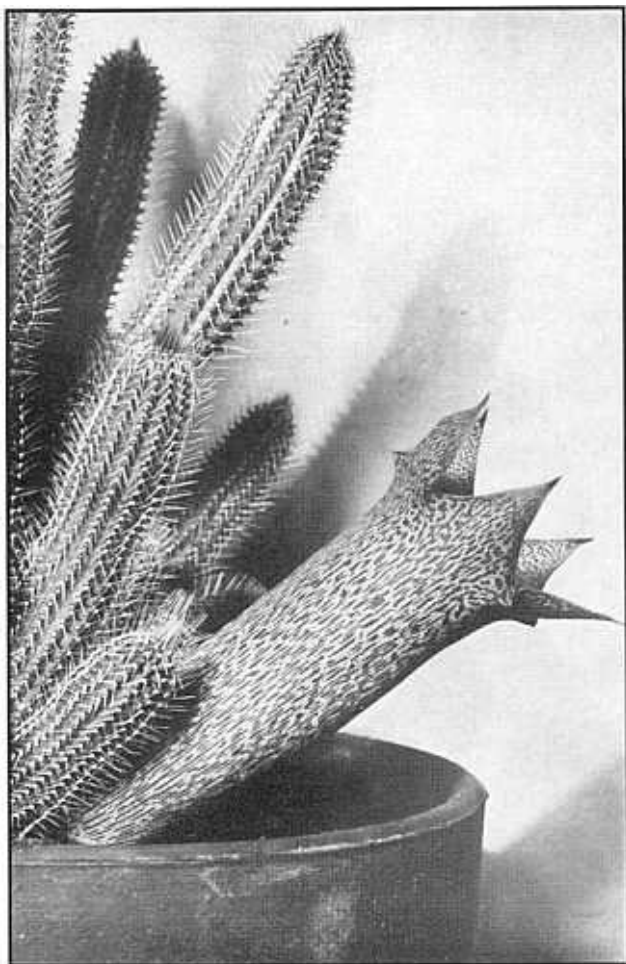


FIG. 1181

Tavaresia grandiflora Berger x 0.8

3. ***Tavaresia grandiflora* (K. Schumann) Berger, Stap. und Klein., 45. 1910.**

Decabelone grandiflora K. Schumann, Engler & Prantl: Pflanzenfam., iv. ii. 275. 1895.

?*Hoodia senilis* Jacobsen, Sukkulente, 78. 1933.

Decabelone angolensis N. E. Brown, ex Jacobsen: Sukkulente, 208. 1933.

(Description by Dr. E. P. Phillips, Flow. Pl. So. Afr., t. 476. 1932):

Stems: a deep green, up to 20 cm. high, cylindric, about 14-angled, 1.5 to 2 cm. in diameter; angles closely set with tubercles each of which is terminated by 3 white bristles, with the central bristle horizontal-ascending and the two lateral rather shorter and deflexed;

Flowers: solitary, arising at the base of the young stems;

Pedicel: slightly marked with red, 2 to 2.5 cm. long, about 5 mm. in diameter at the apex;

Sepals: pale green, 12 mm. long, 4 mm. broad, lanceolate, long-acuminate, glabrous;

Corolla: pale green with purple-red markings without, pale yellow and speckled with purple within, entirely purple-red at the base of the tube; *tube* 10 cm. long, 3.7 cm. in diameter at the mouth, densely papillate within, with the papillae decreasing in size towards the base of the tube; *lobes* 3 cm. long, 3.2 cm. broad at the base, ovate, acuminate, papillate;

Outer corona: 1.8 cm. high, connate at the base for 5 mm. of its length and then divided into 10 appendages which taper into filiform processes and each end in a globose knob; between each pair of appendages is an acute tooth 2 mm. long;

Inner corona: lobes 3 mm. long, strap-shaped, acuminate, incumbent on the anthers.

Type locality: South West Africa: Hereroland: Gobabis.

Distribution: Also at many other stations in South West Africa: Windhoek; Okahandja; Okombahe; Otavi; etc.; Bechuanaland Protectorate: Kalahari Desert; Molepolole; Southern Rhodesia: Wankie Distr.: Wankie Clay Pits; etc.; Transvaal: Zoutpansberg Distr.: between Zoutpan and Waterpoort, on sandy flats; Pietersburg Distr.: between Chunespoort and Mphathlele's river drift, on dolomite; Lydenburg Distr.: Sekukuniland; Cape Prov.: Prieska Distr.

The "large-flowered *Tavaresia*" was first collected by Prof. Hans Schinz in Hereroland, South West Africa, about 1886, and more recently has been found widely distributed clear across the continent to the Transvaal, on both sides of the tropic. The *Tavaresias* overlap so closely that some records of this species may really refer to *T. barklyi*, and vice versa; and we find Prof. Dinter saying of one plant, which he had

collected on the edge of the crater of the extinct volcano, Mt. Bukkaros (Geitsigubeb), near Berseba, South West Africa, that he could not determine to which of the two species it belonged. The relationship of *T. grandiflora* to the other two *Tavaresias* is discussed on p. 1100; but when all is said and done the principal character of *T. grandiflora* remains the extraordinary size of its flowers. The plant is one of the

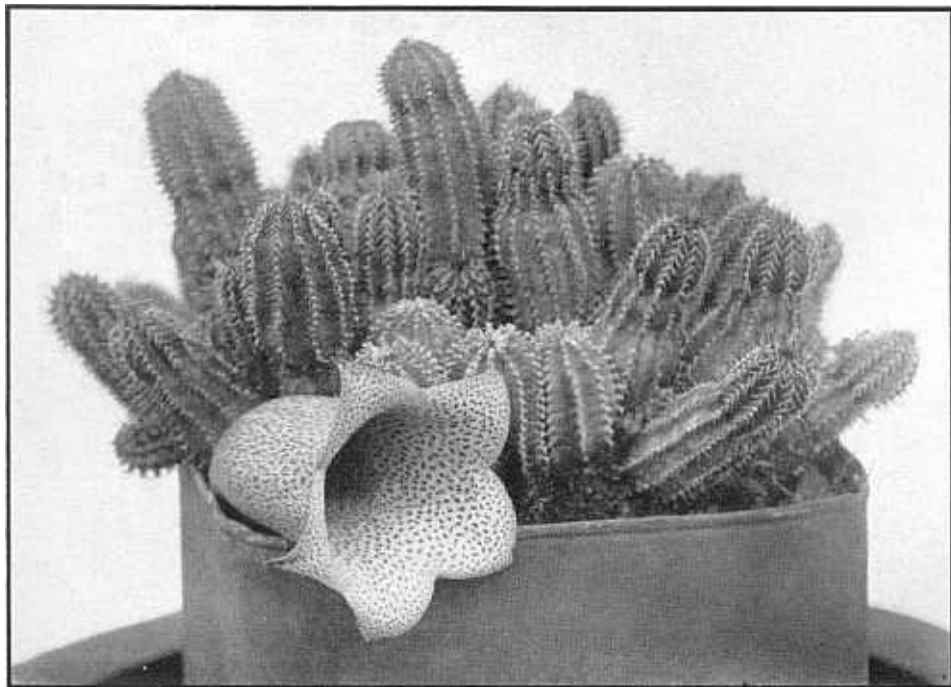


FIG. 1182

Tavaresia grandiflora Berger x 0.75
From the collection of David Pringle.

many shade-loving Stapeliads and forms very much handsomer tufts when growing surrounded by tall scrubby grass, or in shade or half shade, than when fully exposed in the open. One suspects that the size of the flowers may depend at least in part on the environment. J. F. Kirsten, of Pietersburg, Transvaal, has written us of a curious habit which *T. grandiflora* exhibits in common with *Duvalia polita*. "We are now at midwinter," he writes. "The stems of old established *Duvalia* plants, standing in the open, have inclined towards the North, and they now point directly towards the midday sun. I notice that our *Tavaresia* has the same trick of following the sun through his movements. I presume the plants are either trying to present a minimum stem area to the noonday sun, or making certain that the midday rays shall fall

upon the leaves at right angles. No other species seem to have this habit, and it may only be a coincidence that the round-stemmed plants seek the zenith in this remarkable fashion."

"Our Transvaal *Tavaresia*," says Mr. van Son, "should really be made a variety of *T. grandiflora* (var. *recta*), as the corolla does not have the characteristic curve found in the typical South West African form." The curved corolla, to which Mr. van Son refers, is seen in Fig. 1183, and it appears with only slight modification in all the flowers of *T. barklyi*. The straight thimble of the Transvaal flowers is shown in Miss Letty's beautiful colored plate from the Flowering Plants of South Africa, which is the Frontispiece of this volume, as well as in Fig. 1181.

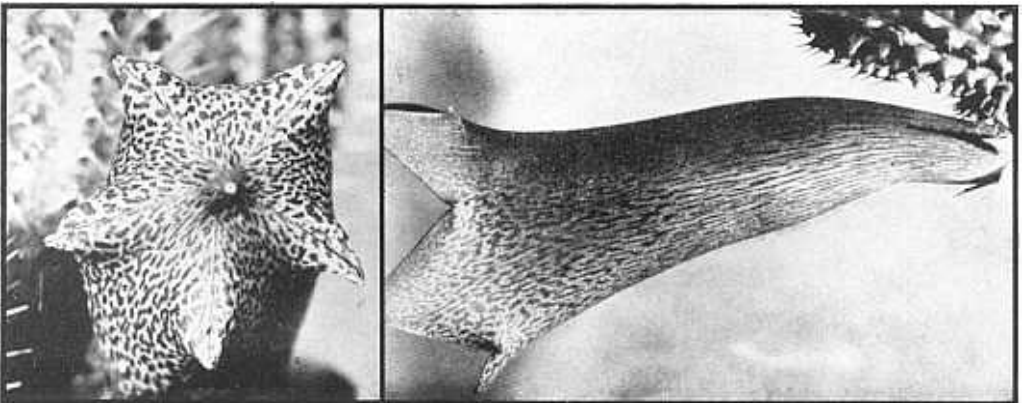


FIG. 1183

Tavaresia grandiflora Berger x 1.

Photo at right by Prof. Dinter in Neue Pfl. D. S.-W. Afr., 1914.

A P P E N D I X A

JUSTUS HEURNIUS

Revised from an Article by Alain White and Boyd L. Sloane in Succulenta, 1933.

The first European known to have collected any plants in South Africa and to have sent drawings of them back to Europe was Justus Heurnius. He was a missionary, not a botanist, and the references to him in botanical literature are very scanty. Indeed, the one genus of succulents named in his honor misspells his name!

Yet he was a man of true distinction, whom it is well for us to pause and honor for a moment. In religious circles his memory is still occasionally cherished and as late as 1897 a very painstaking thesis of 360 pages about him was published in *Nijkerk* by J. R. Callenbach and presented before the University of Utrecht.

Justus Heurnius (the name is a Latinized form of van Heurn, or van Horn) was born at Leyden, Nov. 17, 1587, the sixth child of Johannes Heurnius (1543-1601), a professor of medicine in the University of Leyden. When he was 15, Justus became a student of medicine also, and at 24, received his doctor's degree.

But his interest in medicine appears soon to have waned. His brother, Ottho Heurnius, 1577-1652, had also become a doctor and was already filling the chair of medicine at the University, which the death of Johannes Heurnius had left vacant. The plague of 1604, which swept through Leyden without mercy and carried away two of the Heurnius sisters within ten days, may have made Justus realize something of the futility of medicine, as then understood, and may have helped to turn his thoughts in the direction of religion.

In any case, after graduation, Justus Heurnius set forth on a trip to France and England, which lasted over four years. At this time the Dutch Reform Church had many followers in England, and it would appear that Justus became increasingly interested in it while there, for on his return to Holland in 1615 he went

directly to Groningen, where he studied divinity until 1618.

In particular his mind focused on the condition of the natives in the Dutch East Indies and he wrote his graduating thesis on the "Desirability of making the Indies a Christian country." Since the Mohammedan conquest in 1475-79, the islands had remained under the spiritual domination of Islam. Since 1598 missionaries had gone out from Holland, but their total influence had not been great. None of them had the fire and sincerity of Heurnius. His ideas for the conversion of the Indies, as expressed in his thesis, included careful selection of all persons sent out from Holland from the standpoint of their religious characters, soldiers and civilians as well as missionaries; the establishment of religious schools throughout the islands; and the translation and dissemination of religious texts for the natives.

All this had been thought out without any actual knowledge of the conditions which existed in the Indies. Heurnius left Holland on Jan. 9, 1624, on the Indiaman "Gouda," and he returned home fifteen years later thoroughly disillusioned. From the moment of his arrival the very seriousness of his purpose helped to keep him at the centre of many of the petty private and political intrigues which so frequently crop up in any small white colony in the tropics. His stay in the Indies was during the governor-generalship of four men, whose rule reflected very varying policies, Peter de Carpentier, J. Pz. Coen, Jacques Specx and Hendrix Brouwer. The most favorable to his plans was Coen, who has been called "one of the most influential founders of the Dutch Empire." Under the rule of Carpentier and Coen, Heurnius became a preacher in Batavia and planned the establishment there of a religious seminary. He made a dictionary of the

Examples of the genus *Huernia*,
named for Justus Heurnius.

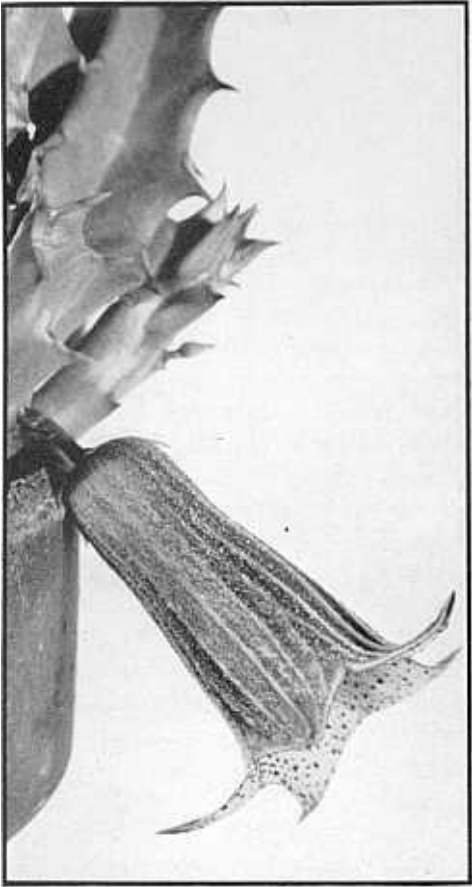


FIG. 1185
The longest tubed of the *Huernia*
flowers: *H. levyi* Obermeijer

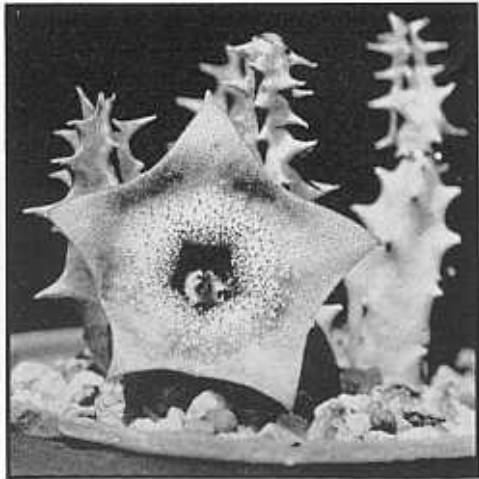


FIG. 1184
A very beautiful *Huernia*: *H. praestans*
N. E. Brown
Photo by W. Triebner, from a plant collected by J. K.
Joubert in the Ladismith district.

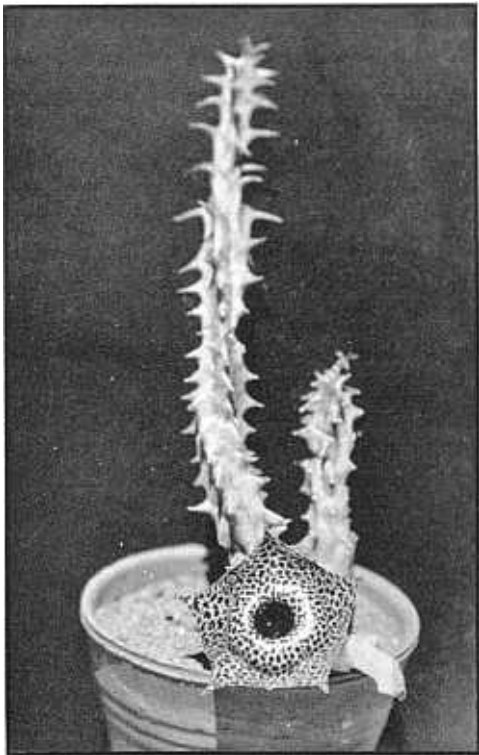


FIG. 1186
An extraordinary annular *Huernia*, for which we
have proposed the name *H. smithersii* (see Fig.
974-A). Photo by W. Triebner.

Malay language, and translated the Confession of Faith and the Ten Commandments into Chinese.

Private difficulties which had arisen between Heurnius and Coen became greatly intensified under Specx, a violent and tyrannical governor-general. Matters culminated when Heurnius publicly assailed the policies of Specx in his church in May, 1632. He was promptly found guilty of insubordination and banished to the Coast of Coromandel, on the mainland of what is now British India. He returned to Batavia in September of the same year, when Brouwer became governor-general. He then was sent to

suffered most grievously from the effects of this adventure, losing temporarily the use of both hands and feet.

More and more he was realizing that his efforts to Christianize the Indies single-handed could not succeed. In 1638 he decided to return home. He sailed on Dec. 23, and arrived in Leyden in June, 1639. The same year the Chamber of Amsterdam honored him for his "extraordinary fine services in India" by a gift of 1200 florins and an invitation to return on another mission. He accepted the testimonial very gratefully, but the invitation he firmly declined. Instead he answered a call to the Parish of Wijk

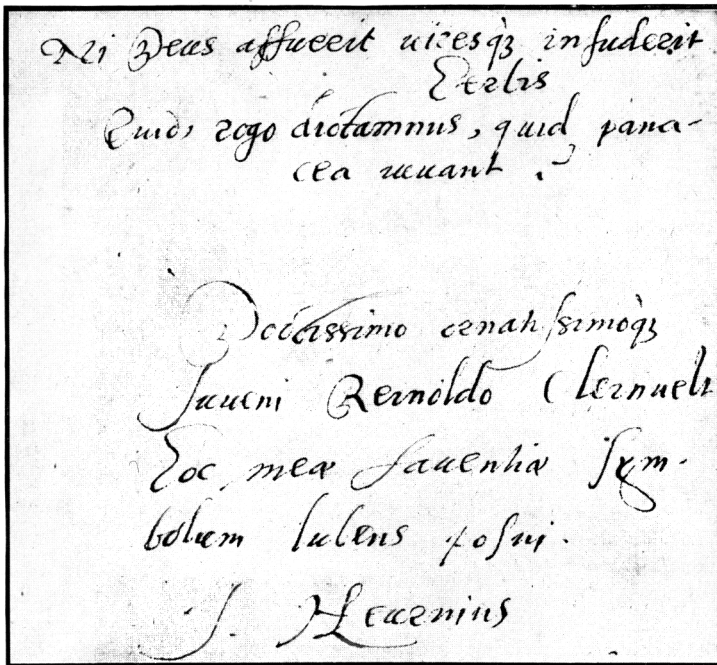


FIG. 1187

Autograph sentiment written by Justus Heurnius in the album of a young friend.

The text reads: "Nisi Deus affuerit viresque infuderit herbis, quid, rogo, dictamnus, quid panacea iuvant? Doctissimo ornatis-simoque Juveni, Reinoldo Cler-nueli, hoc meae faventiae symbolum lubens posui." Translation: "Unless God be near and impart His strength to the herbs, what, I ask, will dittany, what will heal-all avail? For the very learned and gifted youth, Reinold Clernuel, I have gladly written this token of my good-will."

Ceram and later to Amboina, more distant islands, where he worked to establish missions, but everywhere he found difficulties which he could scarcely hope to overcome.

The rajahs who governed much of the island territory, just as the native Indian princes still govern in British India, were even more hostile than the Dutch governors. One of them went so far, while professing friendship, as to invite Heurnius to a banquet and then had his food poisoned, and for the entire year 1635 Heurnius

bei Durstede, 1640, where he remained until his death in 1652.

But he did not forget the converts he had made in the Indies. For them he translated into the Malay tongue the Gospels of St. Luke and St. John, the Acts of the Apostles, and the Psalms. He never married, and at his death he left his estate of some 11,000 florins to assist the descendants of his brothers and sisters, especially in their education.

For us who are interested in the plants of South



FIG. 1188

Huernia zebrina var. *magniflora* Phillips

Photo by H. Herre of a plant from Serowe, Bechuanaland Protectorate. The identification is not certain, and the corolla markings appear distinct from those of the flowers shown in Figs. 987-988.

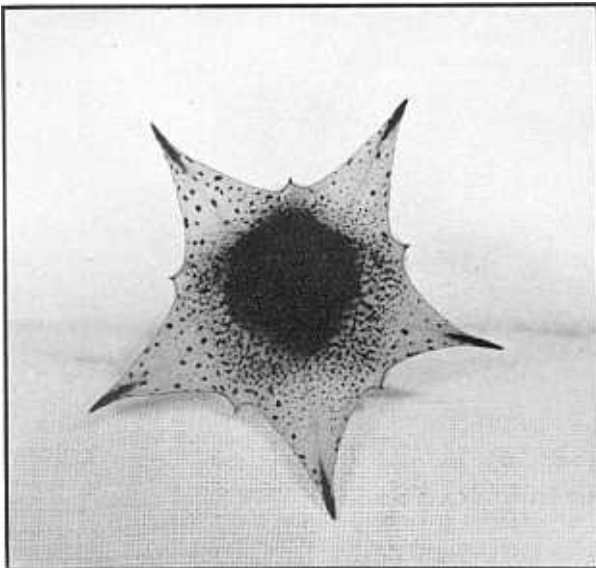


FIG. 1189

The dark trap in a *Huernia*'s throat. Looking down into the corolla-tube of a flower of *Huernia levyi* Obermeijer, whose papillate structure is peculiarly designed for the capture of flies and small insects.

Africa, a single day in 1624 stands out in this long life of religious endeavor, the day when the "Gouda" put in at Table Bay for water and the captain perchance dickered with the Hottentots for a little fresh meat. It was a long and difficult journey. Of the 348 souls on board not less than 19 died before the ship reached Batavia.

In those days there was nothing in the way of a settlement where Capetown now stands, not even a fort. A hollow beneath an inscribed stone served by way of post office, where passing Indians picked up and deposited their mail. We can still visualize the eager, hasty landing of Justus Heurnius, while the "Gouda" was taking on supplies, and the thrill of his little expedition to Table Mountain. We deduce that he went to Table Mountain, not only because it furnished the nearest point of outlook over the surrounding country, but because *Stapelia variegata*, one of the plants he collected, still grows there in profusion.

There is no evidence that Heurnius was especially interested in plants. But he made clever drawings of about a dozen, and the descriptions he wrote to accompany them show that he had a good knowledge of botany for that period. He sent the drawings and descriptions back to his brother, Ottho Heurnius, at Leyden. The latter passed them on to Johannes Bodaeus Stapelius (the name is a Latinized form of van Stapel or a Stapel), a young doctor in Amsterdam, who had graduated at the University of Leyden in 1625. His life hobby was the preparation of an annotated edition of the botanical works of Theophrastus, which he left almost completed at his untimely death in 1636. This great work was edited and published by his father, Egbert Bodaeus Stapelius, in Amsterdam, 1644.

Four pages of the book are devoted to the Heurnius plants. At first it would appear that some of these had been discovered in India, from

the inclusion of the word "indica" in the name, but James Britten, who has discussed this matter, makes out a good case for the supposition that all the plants were actually collected at the Cape. Among the plants figured is *Fritillaria crassa*, now known under the Linnaean name of *Stapelia variegata*. This generic name was coined by Linnaeus in memory of Stapelius, the editor, and Heurnius, the pioneer discoverer, was entirely overlooked.

Later, in 1809, Robert Brown first subdivided the genus *Stapelia* into four genera, and named one of these *Huernia*, to honor Justus Heurnius, whom he called "one of the earliest collectors of Cape plants, from whose drawings the first account of *Stapelia* was taken." Unfortunately Brown misspelled Heurnius' name by transposing the second and third letters, and the regulations of modern botanical practice insist on the perpetuation of the error.

We may equally regret that Heurnius' name was not chosen by Linnaeus to designate the whole tribe of the STAPELIEAE and that it was misspelled by Robert Brown; but we can still be thankful that his memory is associated with a genus of plants as charming as the *Huernias*. The genus includes nearly 50 species of small succulents, distributed from Arabia to the Cape. They are rare enough to be objects of curiosity and value, most fascinating to grow and so compact that a representative collection may be housed in a sunny window or grown into plants of distinction in a greenhouse. They are surely destined to greatly increased popularity among the fanciers of succulents; and we trust these notes will help those who may enjoy their study in the future to associate with them the personality of a worthy pioneer, with a steadfast soul, who faced life squarely and who carried on without betraying disappointment after his early dreams had proved beyond his powers to realize.

APPENDIX B

THE STAPELIADS OF NICOLAAS WITSEN AND PAUL HERMANN

In the works of Linnaeus and his son, a total of five Stapeliads are described. *Stapelia variegata* and *S. hirsuta* are included in the first edition of the *Species Plantarum*, 1753. In the *Mantissa Plantarum*, 1767-1771, Linnaeus described *Stapelia* (now *Caralluma*) *mammillaris*; and his son, in the *Supplementum*, 1781, added *Stapelia* (*Caralluma*) *incarnata* and *S. pilifera* (now a *Trichocaulon*).

Between Justus Heurnius, who discovered *Stapelia variegata*, and Karl Peter Thunberg, who went from Sweden to the Cape in 1772 and there, among other species, collected *Trichocaulon piliferum*, there is a very interesting period, during which the remaining three of the Linnaean species were discovered and made known in Holland.

To understand this period, in the modest terms of these Stapeliads, we must know something of the conditions existing at the Cape and in Holland. When Justus Heurnius stopped at the Cape on his journeys to and from the East Indies, in 1624 and 1639, the shores of Table Bay were wholly uninhabited save by a few Hottentot natives. The first settlement was effected only in 1651, when Jan van Riebeeck was sent from Holland to establish a revictualing station for the vessels of the Dutch East India Company. Colonization followed slowly, governors were appointed, land bought from the natives, farming undertaken, and presently the beginning made of a company garden. This was the state of affairs about 1678, when Simon van der Stel was appointed Commander. He was a strong personality who did more than any of his predecessors to develop the Colony during the 21 years he held office. He interests us particularly because he vastly improved the Company's garden, of which a part may still be seen, the guide books tell us, in the Government Avenue at Capetown.

In Holland the cultivation of exotic plants had been fostered for many years by the example of the splendid garden at the University of Leyden, founded in 1577, and second in date only to the Italian gardens at Padua (1545), Pisa (1547) and Bologna (1567). Students at the University in branches other than botany came under the spell of the Leyden garden, including the medical students Ottho Heurnius and Johannes Bodaeus Stapelius.

In 1664 there was graduated at the University a young Doctor of Laws, who must have spent many hours in the gardens. This was Nicolaas Corneliszoon Witsen (1641-1717), son of the Burgomaster at Amsterdam, a youth of very ac-



FIG. 1190
Nicolaas Witsen
From Noord en Oost Tartaryen, 1705.

tive mind, who craved knowledge as to everything with which he came in contact. He was skilled in mathematics and astronomy and physics. He was devoted to mechanics, in particular to the art of ship-building, in which, as in the science of navigation, he became an authority in later years. Books and maps, exotic plants and flowers delighted him.

All his life Witsen craved travel, and when circumstances prevented his traveling himself he equipped others to visit distant lands on his behalf. He made two expeditions to Russia, where he formed a lasting friendship with Peter the Great. In 1688 he visited England on the staff of William III of Orange, who later became

King of England. According to Macaulay, the Dutch Stadtholder chose Witsen to accompany him because Witsen was the most representative man in Amsterdam, "for the purpose of proving to all Europe, that the long feud between the House of Orange and the chief city of Holland was at an end." Witsen was no politician, did not have the aggressive spirit to help the Stadtholder in his diplomacy, but his record of the English journey was to give later historians their fullest knowledge of its details. It was the discovery of things and the recording of facts which chiefly intrigued him.

Witsen succeeded his father as Burgomaster, and so well satisfied were the good burghers of Amsterdam that they elected him to 13 terms of office. He now had not only private wealth, but public position, and could carry forward his many projects with full authority. He lived in a fine house on the north side of the Keizersgracht on the corner of the Molenpad. Here he cherished his library of rare books, his cabinets of objects of natural history, his paintings and his maps. Hither came famous travelers, men of letters who visited Amsterdam. The leading botanists of the country came to discuss plans for the establishment of a great garden in Amsterdam, the Hortus Medicus at the University. Here too Witsen wrote his books, a treatise on ship-building, a 1,000-page treatise on Tartary. He was a most meticulous writer. When the first edition of his Tartary, 1692, seemed to him incomplete, he ordered the entire printing destroyed and waited 13 years until further explorations gave him sufficient additional material to satisfy him. To Witsen many learned books were dedicated by his contemporaries, poets, travelers, scientists. For him was named one of the quays of Amsterdam, the Nicolaas Witsenkade; and at the distant Cape of Good Hope, the Witzenberg Mountains, 75 miles inland from



FIG. 1191

Stapelia variegata Linnaeus

From Paul Hermann: Cat. Hort. Lugd. Bat.

Capetown, were dedicated in his honor in 1699. We have a picture of him in the words of Voltaire: "Burgomaster Witsen, citizen forever memorable for his patriotism and the use he made of his wealth, which he lavished like a citizen of the world, sending at great cost capable men to collect in all quarters of the world the things which were rarest and chartering at his own expense vessels to discover new lands."

"Forever memorable!" Alas, fame is treacherous, and around the strong features of Consul Witsen, which look out from the great encircling wig in the portrait by Pieter van Schenk, there already hangs a veil which often will baffle our questioning.

The Amsterdam Garden was founded in 1684 and in due course Witsen became the curator. He was in constant association with Paul Hermann (1646-1695), professor of botany at the University of Leyden, only 25 miles from Amsterdam, and he certainly derived much of his botanical knowledge from him. Hermann may be described as a born plant collector, for the tradition is that he loved from his earliest childhood to gather plants. When 10 years old, he was out one day collecting water plants, when his foot slipped, he fell in and would have drowned, says Linnaeus, who is our authority for the story, "had not the fates destined him to traverse much greater waters!" In 1670-1677 he made a memorable journey to Ceylon, with the usual stops at the Cape. "This land of the Cape of Good Hope in farthest Africa no botanist," says Linnaeus, "ever before had trod. Oh, good Lord! How many, how rare and how wonderful plants on this single day presented themselves to Hermann's eyes!"

It is not at all certain that Hermann brought any living Stapeliads into Holland. His only shipment of Cape plants, of which we find mention, was consigned to another botanically minded Burgomaster, Consul Beverningk at Gouda, and the ship carrying the plants was captured by a British cruiser near St. Helena and all the plants were lost. But his herbarium is preserved as a part of the Sloane Herbarium in the British Museum, and it would be most interesting to

learn what Stapeliads, if any, it contains. We surmise that he may have introduced *Stapelia hirsuta* into Holland, but that is only a supposition. And we surmise again that he may have been the first botanist to see *Caralluma mammillaris* at the Cape, for if we interpret names correctly this species is included in a list which Jan Burman of Amsterdam (1706-1779) quoted in the Appendix to a Catalog of Plants from Ceylon, 1737. This list is called by Burman a "Catalog of African plants, which once upon a time Paul Hermann, Professor of Botany, observed at the Cape." Hermann's name, in which we fancy we recognize *Caralluma mammillaris*, is "Aizoides mamillaris, viridis, summitate foliorum spinis coronata." In the year following the publication of Hermann's list, 1738, Burman figured the species in his *Decades of Rare African Plants*, Amsterdam, under the title of "*Stapelia aphyllus*, ad nodos mammillaris, etc."

The association of Paul Hermann, distin-

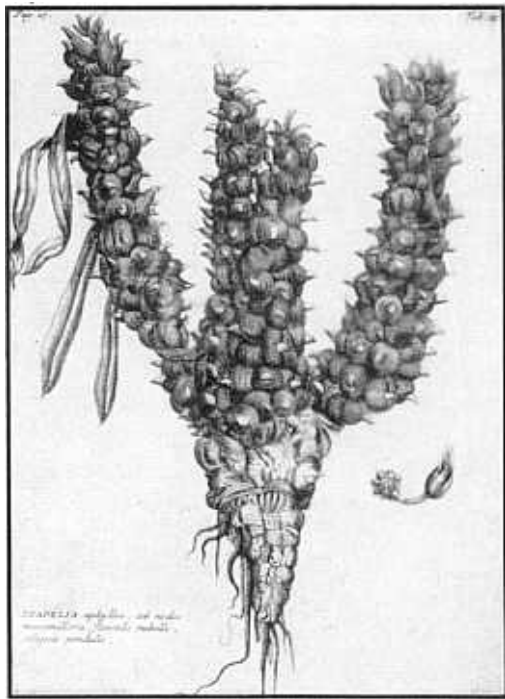


FIG. 1192

Caralluma mammillaris N. E. Brown

From Burman's *Decades*, 1738.

guished traveler and lecturer, with Nicolaas Witsen, burgomaster and dilettante, gave a great impetus to botanical studies in Holland. The new gardens at Amsterdam soon supplemented the Leyden Gardens in making the country a centre for botanical studies in Europe. There is a delightful picture of the period in the

establishment at Hartecamp, near Haarlem, and Linnaeus, in his youth, was glad to become Clifford's botanist, and to catalogue, describe and figure the rarer plants of the collection. Even the gambling on the stock exchange took a tinge from the prevailing fashion, and the bubble speculation of the South Sea Company in England and of the Bank schemes of M. Law in France were represented in Holland by a tulip mania."

Witsen threw himself heart and soul into his botanical studies. He employed "elegant and skillful hands" who drew for him colored plates of the Cape flora and fauna "true to the life" and added names and comments to each plate. So were born several series of plates, referred to by Burman as the Witsen Codexes. In two instances Burman cites the Witsen plates as the source of his own figures. In connection with his figure of *Stapelia hirsuta*, he says: "the tubercles (of the stem) are oblong and subrotund (see Fig. 1193, right), differing thereby from the plant illustrated by the distinguished Commelin (see Fig. 38), whose tubercles are long and acute, as is shown in the Witsen Codex;" and in connection with his plate of *Caralluma incarnata*, which he called *Euphorbium erectum*, he says: "this plant is called the small-flowered African *Apocynum erectum* in the Witsen Codex, and *Tithymalus Africanus* in Caspar Commelin's manuscript catalog to the Codex."

In addition Burman mentions a "van der Stel album," in speaking of his plate of *Stapelia variegata*, saying: "this plant I found beautifully painted in the collection of van der Stel, whence I have figured it."

It would be of extreme interest to be able to trace the whereabouts of these very early Stapeliad drawings, if they still survive, and to learn who the artist was who painted them. Almost the answers have seemed to be within reach, only to fade again into the mist, which surrounds Burgomaster Witsen on so many sides.

One of the Codexes stood out in importance beyond all the others. It was compiled for Witsen from plates drawn on an expedition by Gov. Simon van der Stel to Namaqualand in 1685.

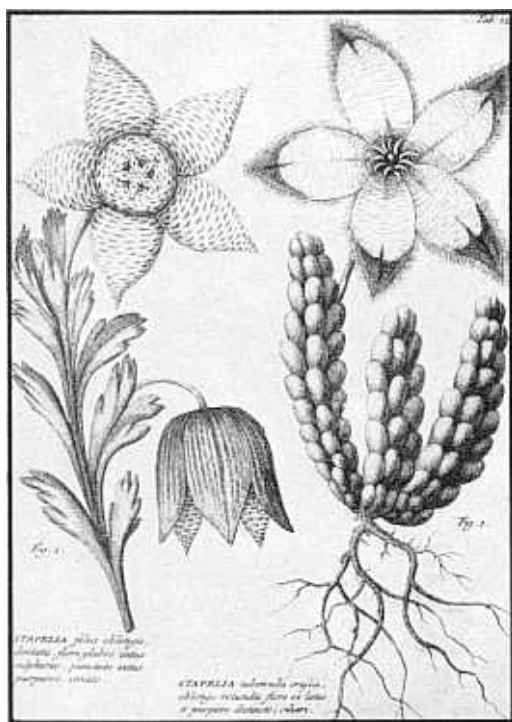


FIG. 1193

Stapelia variegata and *S. hirsuta*

From Burman's Decades of Rare African Plants, '38.

Presidential address of Peter MacOwan (after whom *Stapelia macowani* is named) before the South African Philosophical Society in 1888. His subject was "Personalities of Botanical Collectors at the Cape," and he says in part: "The collection of natural curiosities of all kinds from the countries visited by the Dutch mercantile marine, then at its best, became the fashion of the day. No doubt the acquisition of rare and curious objects was, with most, a mere amusement, like the modern cult of bric-a-brac and old china, but it served science well. . . . The wealthy Clifford outshone all private cultivators in his splendid

Caspar Commelin (1667-1731), botanist and historian of Amsterdam, and Burman treasured it beyond all their other sources in dealing with the Cape plants. Witsen lent the Codex to Commelin, and he retained it after Witsen's death. At his own death, his "much esteemed widow" passed it on to Burman, "who expected no such honor." Burman accepted the volume with awe, as "the splendid Codex, compiled by the solicitous care and magnificent generosity of our Consul."

This principal Codex next came into the hands of Jan Burman's son, Nicolaas Laurens Burman, who died in 1793. It was sold at auction (in Leyden?) in 1800, but the purchaser is unknown. In 1829 the collection turned up in Capetown and it is now in the South African Museum, resting as the years pass in its original vellum binding ornamented with a stamped design in gold.

It was to be hoped that the original drawings of Burman's plates would be found in this memorable collection, but Dr. J. Luckhoff, who has examined it for us, states that it contains no *Stapelia*s at all. Other collections of plates, showing plants, insects, lizards, birds and snakes, are preserved in the South African Library at Capetown, in Berlin and in other European libraries. But as yet there is no evidence of the survival anywhere of the original *Stapelia* drawings reproduced by Burman.

But as we have Burman's copies, it is pleasant to speculate on their original painter. Dr. Gilbert Waterhouse, of the University of Belfast, author of a detailed study of the work of Hendrik Claudius in the introduction to his reprint of Simon van der Stel's Journal of his Expedition to Namaqualand, 1685-86, (Dublin, 1932), attributes the drawings in the principal Codex, just described, to Claudius, and a comparison of the style in these drawings and the plates of Burman, all somewhat amateurish to the modern eye, makes it at least plausible that Claudius was the artist in the case of Burman's *Stapelia* plates too.

Hendrik Claudius was a native of Breslau in Silesia and an apothecary by profession. He went

out to Batavia in the last quarter of the 17th century, and thence was sent to Capetown by Dr. Andries Cleyer to collect botanical specimens. His skill in drawing made his services invaluable to the growing circle of those interested in the study of botany and zoology alike. Olof Bergh took him as artist and journalist on an expedition in 1683, as far as the Groen River at the southerly end of Little Namaqualand. Father

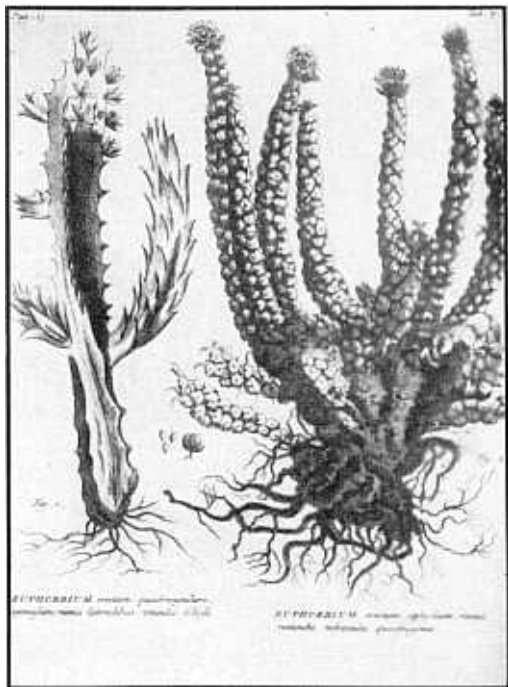


FIG. 1194

Caralluma incarnata N. E. Brown
(*Euphorbium erectum*)

From Burman's Decades, 1738. Note that Burman classed his *Caralluma* with a *Euphorbia* (right).

Tachard, who visited the Cape in 1685, said of him: "He draws and paints animals and plants to perfection. The Dutch have kept him to help them in their explorations and to work at the Natural History of Africa. He has already completed two thick folio volumes of diverse plants, painted from nature, and he has collected specimens of all sorts, which he has pasted into another volume. This learned Doctor has already made several journeys to the north and east as far away as 120 leagues."



FIG. 1195

Jan Burman, from *Thesaurus Zeylanicus*, 1737

Dr. Luckhoff points out that the drawings of Burman's *Stapelia* plates, if made by Claudius, were probably not made during the van der Stel expedition, as this commenced in July, and the Stapeliads are in flower mostly in February and March. But the journeys mentioned by Father Tachard, 120 leagues north and east from Capetown, would have given Claudius an opportunity to reach the habitats of every Stapeliad known to Burman.

Whoever prepared the plates had an unusual botanical sense for the time. This is shown in the case of Burman's plate of *Caralluma incarnata*. Caspar Commelin in 1715 called the plant a *Tithymalus* (now a subdivision of the *Euphorbias*) and Burman in 1738 named it a *Euphorbia* outright. But in the Codex it had been classed as an *Apocynum*. Now *Apocynum*, or Dogsbane, was the genus in which *Stapelia variegata* and *S. hirsuta* were still included in Witsen's day. It was Paul Hermann's name in 1687, and the only

name used from that year until 1699, when the *Stapeliads* were placed under *Asclepias*. So we find that the compiler of the Codex realized that a plant of the sort we call a *Caralluma* was directly related to the *Stapelias*, whereas later experts, Commelin and Burman, both of whom knew the Witsen Codexes, confused the plant with *Euphorbia*.

The stimulus of Witsen's interests was certainly one of the causes of the boom in Cape flowers at the Cape. When Commander van der Stel realized the extent to which the fad for exotic plants was developing at home, he entered eagerly into the business of supplying materials, hoping for such prestige as invoices of plants might confer upon him. Professor MacOwan feels that van der Stel and his son and successor, Willem Adriaan van der Stel, claimed the credit, while the botanists of the Company's garden did the work of scouring the country for new species.

James Britten, who has written delightfully of the Early Cape Botanists and Collectors, in the *Journal of the Linnean Society*, 1920, tells us that Henry Bernard Oldenland, the first botanist of the Company, was a Danish physician, who went to the Cape and died there about 1699, "though he deserved a better fate and a longer life," as one contemporary said of him. In an old letter of 1701, quoted by Mr. Britten, we read that upon Oldenland's death his wife married again "a man who will not trouble his head with these *foelerys* (as he calls them)." She was a woman "of a covetous temper," who made those wishing to obtain her husband's collections "sufficiently pay for them." It is possible that some of the drawings in the Witsen Codex were made by Oldenland. After his death his place in the Company's garden was filled by a Dutch botanist, Jan Hartog (or Hertog).

Hermann's list of Cape plants, dating from 1670-1677, numbered around 765 species, and Burman, when he published it in 1737, supplemented it with another list of some 350 species, "which Oldenland and Hartog, famous botanists, at one time discovered at the Cape of Good Hope and named." Allowing for the many duplica-

tions, we have evidence from these two lists alone that nearly 1,000 Cape plants were known during this period of Witsen and Hermann in Holland, and Oldenland and Hartog at the Cape. In many cases the notices of individual plants, which rarely exceed a line or a line and a half, are extremely vague, and it is not surprising that Hermann's *Caralluma mammillaris* of 1677, even though figured by Burman in 1738, failed to be taken up by Linnaeus until 1767-1771, while Witsen's *Caralluma incarnata*, also figured by Burman, was not noticed by Linnaeus the younger until 1781.

All we can see at all clearly through the shadows which two centuries and a half have drawn around Consul Witsen is that, with such men as Hendrik Claudius, Paul Hermann and Henry Oldenland, he loved and studied the Cape flora, and that between them they first introduced to Holland some knowledge of the three Stapeliads, *Stapelia hirsuta*, *Caralluma incarnata* and *Caralluma mammillaris*, which bridge the long interval that separates the discovery of *Stapelia variegata* by Justus Heurnius in 1624 and the first new discoveries of Thunberg and his contemporaries nearly a century and a half later.

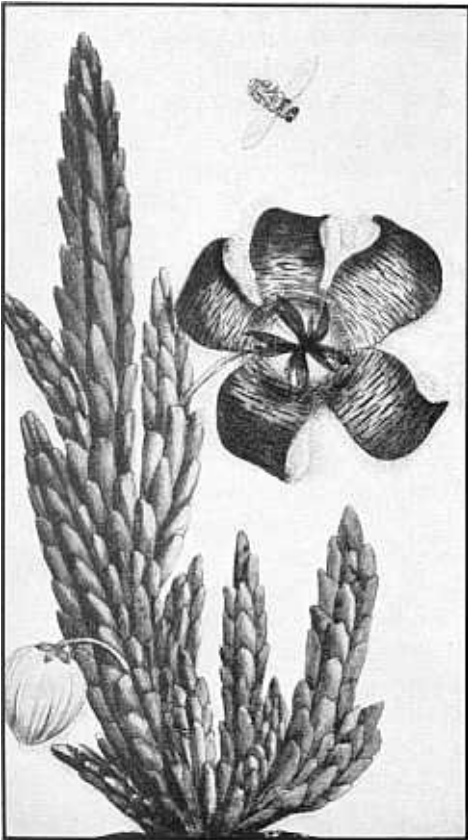


FIG. 1196

Stapelia hirsuta Linnaeus

From an old plate published by
E. P. Nodder and Co., 1791.

APPENDIX C

GUAAPS AS FOOD AND MEDICINE

(Extract from an article, *About Succulent Plants*, by Dr. N. E. Brown, in *The Cactus Journal*
London, December, 1932.)

Mr. Pillans had a Hottentot in his employ, whom he saw take some stems of *Stapelia flavirostris*, split them down the middle and hold them before the fire to wither and then apply them to a cut, so he made inquiry of the Hottentot as to the uses Bushmen and Hottentots made of these plants, for Kaffir races do not appear to make use of them as *Stapelias* are rare in the region they inhabit. This is what Mr. Pillans wrote:

"Several times I got the Hottentot to taste as many of the edible kinds in my collection as I could spare bits from, and to point out which of the others were edible and which poisonous. He comes from Griqualand West and is well acquainted with most of the species, for he was with De Wet and then with the British during the Boer War, and of his own accord he wandered about Cape Colony and Orange River Colony, so he should have seen many different kinds. As a result, I find that of the genus *Stapelia*, all in the sections *Orbea*, *Tridentea* and *Podanthes* are edible, *S. variegata* and *S. verrucosa* being favorites. Sections *Tromotriche* and *Caruncularia* have none that are edible, *S. pedunculata* being known as 'sore head' (Kop Seer), as when a little of the juice gets on your tongue the bitterness gives a headache, and if too much sap is taken violent sickness and death result. In the section *Stapeltonia* those species with stout, hairy stems are poisonous, only a few of the kinds with thin stems are edible. Many *Carallumas* are eaten, but some are pois-

onous. *Huernias* are all edible so far as I can make out, although some are not liked, being too bitter. I tried *H. primulina* and could not get the bitterness out of my mouth for two days, but it is eaten by the Hottentots as a cure for headache. The stems of certain *Duvalias* and *Piavanthus* are taken instead of pills or castor oil.

"The sap of *Stapelia flavirostris* and allied species of 'Slang Guaap' is used by natives to inoculate themselves to keep off certain diseases. Little slits are made anywhere in the body and the juice rubbed in. They also mix the sap of 'Slang Guaap' with snake-poison; the mixture is put on their arrows, so that when a buck is shot the poison does not circulate through the whole body.

"He knows *Huerniopsis decipiens* and says it has often been his only food for a day when traveling in Griqualand West. I had often heard of Hottentots subsisting for many days on *STAPELIEAE* in the Karroo, for that is about the only food growing wild there. This chap confirmed the fact and told me that when he left his Boer master and walked westward to the towns of the Bechuanas, he was without provisions and his only covering a shirt and sheep's skin, and obtained his food from the veld, which only provided 'Guaap' (*Trichocaulon*) and other *Stapelias*. Water was obtained from wild gourds, and occasionally meat was possible when he could kill a bird with a stone."

Journeying day after day under such conditions must indeed be unpleasant.

APPENDIX D

LOCAL NAMES OF THE INDIAN CARALLUMAS

From F. H. Gravely and P. V. Mayuranathan: Indian Species of Caralluma, in Bulletin of the Madras Government Museum, Madras, 1931.

Following Schumann, Berger divides the genus *Caralluma* into three sections, *Eucaralluma* (= *Caralluma*, *s. str.*), *Lalacruma* and *Boucerosia*, of which only the first and last are Indian, the second being confined so far as is known to East Africa, and differing from the first only in having a pedunculate gynostegium.

Caralluma, *s. str.*, and *Boucerosia* can easily be distinguished, at least so far as Indian forms are concerned, by the arrangement of the flowers and by the nature of the stems. In *Caralluma*, *s. str.*, the flowers arise in (or more usually close beside) the axils of the rudimentary and evanescent leaves all along the distal portion of the stem; in *Boucerosia* the flowers are either terminal (usually in compact umbels though sometimes solitary) or, in the single species known from Baluchistan, the Punjab, etc., in compact umbels arising in leaf axils, but not in series, always isolated. In *Caralluma*, *s. str.*, the stems are almost always more or less distinctly tapered distally, usually very markedly so, at least when fully matured; in *Boucerosia* the stems are of approximately uniform thickness throughout.

Young shoots of *Caralluma*, *s. str.*, though very bitter, are commonly eaten raw in South India. The larger forms of *Boucerosia* do not seem to be eaten at all except by the Oddans of Coimbatore and Salem districts, who first cook them. But, among the smaller forms distinguished below as the *indica* group, the only two which we have found wild—*B. indica* and *B. pauciflora*—are particularly liked, for instead of being bitter they are pleasantly acid to the taste.

The general Tamil name for the genus as a whole in the Coimbatore, Salem, Arcot and Chingleput districts associates it with the common succulent *Euphorbia* (Tamil, *kalli*) and may be taken to mean either "that which resembles a *Euphorbia* shoot" or "that which lives among *Euphorbia* and thorns" according as it

is rendered *kallimulaiyan* or *kallimulliyen*. In Shankaridrug in the Salem District, however, the name *kilivan* is used—possibly a corrupted form of the usual one—*Boucerosia* of the *umbellata* group being distinguished as *oddan kilivan* on account of its being eaten, as already noted, only by the Oddan caste. Further south these names are replaced by *eluman* (= young deer) in Pudukkottai and the surrounding districts and by *siruman* (= small deer) in Palni, Dindigul and Madura in the Madura District and Papanasam and Tenkasi in the Tinnevely District. Eating the plant is said to give the agility of such animals, but whether the name originated in the belief, or the belief in the name, we cannot say. The latter is perhaps the more probable, in which case the name may conceivably have originated from a fancied resemblance between pieces of the plant and the horns of a deer. In Tiruppattur, Ramnad District, the plant seems to be regarded as a sour form of *Vitis quadrangularis* or *pirandai*, being referred to simply as *puliyam pirandai*. The general name used in Pollachi and at the foot of the Anamalai Hills is *iluvan*, large, coarse inedible forms being distinguished as *malai (hill) iluvan*, while those eaten are called *pulichan* (sour thing). In Thakalai in South Travancore the association with *Euphorbia* reappears, the name used being *paraikalli* or "rock *Euphorbia*." Only large, inedible forms seem to occur there. The usual name in South Travancore and the neighboring parts of Tinnevely (e.g. Kalakad) is *kallukutainchan* or "that which pierces the rock." *Caralluma*, *s. str.*, is distinguished as *chinna* (small) *kallukutainchan*, *C. (B) procumbens* as *periya* (big) *kallukutainchan* and *C. (B)? umbellata* (no fully developed flowers seen) as *peyi* (devil) *kallukutainchan*.

The *umbellata* and *indica* groups of *Boucerosia* are distinguished from *Caralluma*, *s. str.*, by

prefixing the name of an animal, or more rarely an adjective, suggesting large or small size. Thus in the Coimbatore, Salem, Arcot and Chingleput districts the prefix *erumai* (= buffalo) and in Madura, Pudukkottai, etc, the prefix *madd* (= cow) are used to distinguish the larger *Boucerosia* (*umbellata* group) from the true *Caralluma*, the smaller ones (*indica* group) being distinguished by the prefix *koli* (= fowl) in Madura and *chitt* (= small) or *musal* (= hare) in Pudukkottai and the neighboring districts. In Madura *Caralluma*, *s. str.*, is distinguished as *panri* (= pig) *eluman*. Elsewhere the group name without any prefix is used in a more special sense to indicate this subgenus.

The general Telugu name for *Caralluma*, *s. lat.*, is *kundeti* or colloquially *kundelu* (= hare), *chevi* (= ear) or *chevulu* (= ears) or *kommu* (= horn or *kommulu*=horns) presumably on account of the form of the seed pods. Members of the *indica* group are, however, usually distinguished as *eluka chevulu* or rat's ears, doubtless on account of their small size. In the Antapur District the name *kalabanda* is the name

most commonly used, though elsewhere it seems to be confined to aloes and agaves. It means literally "a dweller among rocks."

At Hospet in the Bellary District the Kanarese were found to combine the Kanarese word *buli* with the Telugu word *chinta*, both meaning tamarind, and to use the resulting *bulichinta* for *Caralluma*, apparently restricting it to *Caralluma*, *s. str.*, though *Boucerosia umbellata* also grows there. In the Kudligi taluk of the above district the Kanarese name for *Caralluma*, *s. str.*, is *pokkidi*. It is considered as a remedy in toothache, the plant being applied to the teeth after getting warmed in fire.

At Palghat, where only *Caralluma*, *s. str.*, is known, it is called in Malayalam *pulichha* (sour) *thanda* (stick).

In the Mysore State the Kanarese name for *Caralluma*, *s. str.*, is *kirjige* and that for the *umbellata* group is *bekkadage*. The Sugalis of Pulinjur eat both in their curries and in their language the two groups are known as *sakkarabunti* and *molli* respectively.

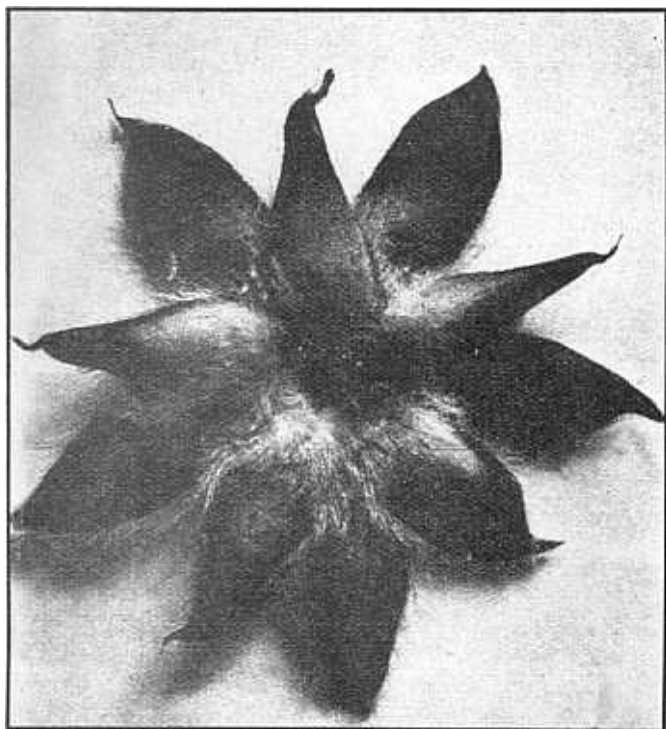


FIG. 1197

A double *Stapelia*

Courtesy of the Cape Times, 1935.

APPENDIX F

THE SUBDIVISION OF THE GENERA CARALLUMA AND STAPELIA

NOTE: The genera *Caralluma* and *Stapelia* form the principal backbone of the Stapeliad tribe. The intermediate character of a few species has suggested the union of the two into a single genus; and on the other hand the individual character of other species has suggested their subdivision into a larger number of new genera. Haworth alone planned to divide *Stapelia*, as it is known today, into seven genera, his new names having been retained as informal subdivisions only; other suggestions of amputations, in both *Caralluma* and *Stapelia*, are not infrequent. The views of Dr. N. E. Brown on these matters are so important that they are quoted here, the first extract being from his article on the Stapeliae Barklyanae in Hooker's *Icones Plantarum*, London, 1890, and the second from comments following his published description of *Stapelia semota* in the *Cactus and Succulent Journal of America*, 1933.

"Some twenty years ago, when I commenced to study this group and to cultivate them, the great difference in habit, and in the shape and structure of the flowers of different kinds; certainly seemed to me to warrant their generic separation as proposed by Haworth. But as my knowledge of them has increased, chiefly by means of the splendid collection sent by Sir Henry Barkly, so have I found that the characters which seemed so distinctive of one genus or group, when only comparatively few species were known to me, gradually merged into and became blended with the characters of another group, and that with another group, and so on, as I became acquainted with other forms. And now after a study of many years—during which a very large number of specimens, amounting to some hundreds, living, dried and preserved in alcohol, have passed through my hands—I am quite unable to find any definite limiting characters for some of the genera here retained. The genera have been chiefly founded upon the structure of the corona, shape of the corolla, and habit of the plant. Habit, we know, is often a fallacious character, as, for example, in *Veronica* we have annual and perennial herbs, and evergreen shrubs; in *Oxalis* and *Pelargonium*, annuals, bulbs, and shrubs; in *Euphorbia*, leafy herbs and shrubs, and leafless succulents of very diverse habit; and among *Stapeliae* habit appears of no more generic importance than in the genera

named. It is true that a similarity of habit prevails among many of the species having the same floral structure, and so forming a distinctive group, but such habit is not invariably limited to those species; for instance, the stems of the plants which belong to the group called *Gonostemon* by Haworth are exactly imitated among those to which he restricted the generic name *Stapelia*: the stems of *Diplocyatha* are very like those of *Stapelia namaquensis*; and those of the plant figured by Masson as *Stapelia aperta* have exactly the same general appearance as those of *S. pedunculata*: but the corolla has a distinct campanulate tube, and the structure of the corona is that of *Caralluma*, so that they cannot both be placed together in the same group; and the stems of *Piarranthus* and *Huerniopsis* resemble those of *Duvalia*. It is evident, then, that no definite generic character is to be found in the stems. The corolla varies considerably among the different members of the same genus: in *Stapelia* itself it is usually flat and rotate, but some species have a saucer-shaped or shortly campanulate tube, without any alteration in the general coronal structure. With regard to the coronal structure, that appears to me to be so indefinitely variable that it cannot, when taken alone, be implicitly relied upon for generic distinction. To give a few instances: in the plant I originally described as *Quaqua hottentotorum* I have seen specimens, living and in alcohol, in

which a distinct outer corona was present, and others in which it was quite absent, or so rudimentary as to appear so! Yet the plants were otherwise identical, and certainly belong to but one species, and not to two genera as would be the case if the coronal character only were taken into consideration. An undescribed species of *Trichocaulon* has the stems and flowers very similar to those of *T. piliferum*, but a corona like that of *Hoodia*. *Stapelia intermedia* offers another case of variation in the same species; in floral structure it appears to be quite intermediate between the sections *Tridentea* and *Podanthes* of the genus *Stapelia*: the three-toothed segments of the outer corona are usually free to the base, as in the typical *Stapelias*, but sometimes they are connate, or adnate to the sides of the segments of the inner corona, up to the point of origin of the lateral teeth, so as to form an annular corona with five large teeth, and five pairs of minute teeth alternating with them, thus resembling the corona of certain species of *Caralluma*, in which genus such a coronal structure would place it, whilst the other form of corona places it in *Stapelia*. It would be easy to give other instances, but these will suffice to show that, except in a few of the genera, no character, or in some instances even no set of characters, can be relied upon as definitely separating the genera. They all seem to blend and intermingle in a manner that in many cases defies classification.

"I believe this intermingling of characters has been brought about in this way: the *Asclepiadaceae* all require the agency of insects to bring about fertilization; and two species growing within a moderate distance of each other would become very liable to be cross-fertilized with each other's pollen, and hybrids would be likely to result, which would not necessarily be found in the neighborhood of their parents, as the seeds, being provided with a large tuft of long, fine hairs, would be liable to be carried to a considerable distance by the wind, in the same way as thistle seeds are carried, and the new hybrid established in another place, where it in turn, in course of time, might give rise to other hy-

brids. That such has been the origin of many of the species is a conclusion that inevitably forces itself on the mind when such species as *S. barklyi*, *C. lutea*, *C. intermedia*, etc., are examined and compared with other forms. For these reasons I am in favor of uniting most of the forms under the two genera *Stapelia* and *Caralluma*, which, although containing (in the sense that I understand these genera) a heterogeneous assemblage of species in each case, yet, in most cases are seen to be bound together by evident relationship with one another when all the species, described and undescribed (of which there are many), are passed in review. These two genera certainly have a tendency to merge into each other, but seem to have this distinction: in *Stapelia* the segments of the outer corona are free to the base, whilst in *Caralluma* they are more or less connate with each other, or adnate by their edges to the segments of the inner corona, so as to form a cup-shaped outer corona. If the various forms be not so grouped under these two genera, then a large number of small and often monotypic genera would have to be made, especially if the coronal structure is made the basis of classification as hitherto, and taking each variation as of equal generic value. Such genera would be very unnatural, and would be rather a hindrance than an aid to the student who wished to determine his plants; hence I have only retained as genera those groups of species which seem connected with each other by natural bonds, although often diverse in appearance. Yet, in spite of having thus limited the genera to few, rather than increased their number, I am of the opinion that some of the genera still retained are more artificial than natural; for instance, *Frerea* and *Trichocaulon* only differ from *Caralluma* in habit, and *Trichocaulon* only differs from *Hoodia* in its corolla, for, although some of the species have a different corona, one has a corona indistinguishable from that of *Hoodia*; possibly it would be more logical and convenient, after all, to do as our predecessors did, and place them all in the genus *Stapelia*, with the exception of *Tavaresia*, *Diplocyatha*, *Duvalia*, *Huernia* and *Huerniopsis*. This view of consolidating the

genera especially commends itself to me, as I have every reason to believe that, if collectors would but pay a little more attention to them than hitherto, there are still a large number of forms that remain to be discovered in South and Tropical Africa, many of which, in all probability, will be found to connect and bring together more closely some of those forms which at present appear to be somewhat anomalously placed in the genera where I have located them."

"No botanist can study a family of plants exclusively fertilized by insects such as ASCLEPIADACEAE and ORCHIDACEAE without soon discovering that many of the genera and species belonging to it are of hybrid origin. This is very obvious among the STAPELIEAE and appears to have been brought about somewhat in the following manner. The seeds of this group are furnished with a tuft of long and fine hairs by means of which they may be blown by wind for a considerable distance. If one is carried from its own area to that inhabited by a different genus or spe-

cies of the same group and develops into a plant, as it can only be fertilized by insect aid it will stand a great chance of being hybridized or of hybridizing the other species. And if that occurs and the offspring develop into flowering plants a new form comes into being, which, if we know its parentage we call a hybrid, but if we do not know its parentage we call a species, and the latter is mostly the case. From the very great amount of variation found in the corolla and corona of *Stapelia* as at present constituted, and from the manner in which these variations are all found to merge into one another when the whole series is taken into consideration, it becomes evident that hybridization must have occurred in numberless directions to have evolved the present group of species. And upon a close study of the group I have found it hopeless to further divide the genus, as no characters can be found that are constant. When only a few species are reviewed it may seem practicable, but not when the whole are examined."

NOTE: The view opposed to Dr. Brown's, namely that Stapeliads do not hybridize generally in the native state, is expressed by W. Triebner, who writes in part:

"Our South West African Stapeliads are very distinct species, and yet I have never been able to determine the existence of a single hybrid form. *Stapelia flavopurpurea*, for instance, is a very widely distributed species. In the valley of the Auob River there are many thousands of plants in close contact with *S. marientalensis* and *Caralluma lugardi*, yet I have never seen a single hybrid; and in the eastern Kalahari there are again thousands of plants in close contact with *S. kwebensis*, or with *S. kwebensis* var. *longipedicellata*, yet again not one hybrid. It is true that the flowers of *S. flavopurpurea* are very variable in color, but this I attribute to the varying chemical content of the soil, and not to hybridization.

"Another example is furnished by the genus, *Hoodiopsis*, native south-east of Warmbad, which blends characters of *Hoodia* and *Caralluma*. Yet the only Stapeliads in the neighborhood are *S. portae-aurinae* and an occasional plant of *S. juttae*, and some *Duvalias* and *Piarranthus*. The nearest *Carallumas* are more than 60 miles away, to the south by the Orange River. Much further investigation will be necessary before we can understand how such species actually have developed."

A few instances of possible hybridization among Stapeliads under natural conditions have been mentioned in the course of this book, among others at pp. 173, 455, 570, 688, 842, 956, 1026 and 1096.

A P P E N D I X F

HUNTING FOR STAPELIEAE IN THE RICHTERSVELD

By H. Herre

The Richtersveld (called after Dr. E. Richter, a Rhenish Missionary Inspector from Barmen, Germany, about 1830) is the most northerly territory of Little Namaqualand, where the Orange River makes its last big bend before entering the Atlantic Ocean. All the country lying north of the "Great River" belongs to South West Africa, while south of it lies the Richtersveld. Its southern boundary is nearly as far south as the railroad from Port Nolloth to Anenous.

Along the sea the Richtersveld is dry and sandy, as is most of the south-west coast of Africa, but it is there that one finds the most beautiful diamonds and Alexander Bay is the richest diamond field in the world. Vegetation is very scanty. Further inland come vast plains, very sandy in some places, where terrible sandstorms rage nearly every afternoon. In this region is the home of one of the most interesting Euphorbias, *E. stapelioides*, first discovered about 1830 by the famous plant collector, J. F. Drège. For a century this plant was only known from a few little bits of herbarium material in the Paris herbarium, and botanists were doubtful whether the name was really appropriate. I was fortunate enough to rediscover the plant, which does really look exactly like a small *Duvalia* or *Piarranthus*, only $\frac{5}{8}$ cm. high, though the flower shows immediately that it is a Euphorbia. It grows only on one little spot.

Continuing inland from here one approaches a huge mountain range already seen from the coast. These high mountains, called the Richtersveld Barrier, overlook the whole of the Richtersveld. The highest of them are the only places where permanent water streams can be found all during the hot dry summer months, while the smaller mountains and hills are destitute of any running water. The rainy season in the Richtersveld comes in the late winter and that is the

only time one can travel there. Then the whole country will blossom into a sea of flowers, all over the sandfields, hills and mountains, and it will be as beautiful as the Bible tells us the world was on the third day of Creation. In summer the water and the flowers vanish together, the sandfields become bare of every bit of vegetation, the soil is cracked by the hot sun, shrubs and bushes are gray, some without leaves, and the whole land is desolate and deserted.

On the east side of the Richtersveld Barrier, the side away from the sea, the same desolation of the landscape continues in the spring, for the high mountains intercept all the moisture coming from the sea. The nearer one comes to the Orange River, which runs in places through deep gorges, the barer the hills become, until finally the stony hills and mountains are entirely naked of any vegetation. And then suddenly one arrives at the green banks of the River, a veritable Fata Morgana in the desert, where the emerald-green fields of grass and the willows and other trees and shrubs are rejoicing in the richness of the soil which the Great River has brought down from the Transvaal and the Free State.

The Richtersveld mountains consist in part of granite and sandstone, where nearly no succulents can survive, and in part of decomposed slate, which is retentive of water and provides the best foothold for succulents. The mountains are rich also in copper, and other metals including gold are found.

I have been to the Richtersveld three times, in 1929, 1930 and 1933, the first time in company with Rev. G. Meyer, the well-known succulent collector of Steinkopf. On this first visit I had the good fortune to see the land in all its glory. I will never forget the far flung carpets of flowers of *Dimorphotheca*, *Lapeyrousia* and other bulbous plants. On the mountains shrubs and suc-



FIG. 1198

Expedition to the Richtersveld, 1929

Hans Herre is next to the driver. The man with the black hat is Rev. G. Meyer; behind him is the head of Mr. Herre's father, C. Herre; and the young man with the straw hat is Helmut Meyer, son of Rev. G. Meyer. Photo taken near Sendlingsdrift. Note the *Trichocaulon* on top of the boxes of plants.

culents were flowering in profusion, and travel was a joy. Like most travelers we came in from the south, not along the main road, if one can call it so, which runs from Karrachab to Sendlingsdrift and on to Warmbad in South West Africa, but along a side track. Here too Prof. Pearson had entered the region, near Stinkfontein, on his Percy Sladen Memorial Expedition. As ugly as the name sounds, so beautiful is the countryside here for a botanist. We arrived about noon and immediately I set forth to climb the Stinkfontein mountain, one of the higher peaks of the Richtersveld Barrier.

Already at the foot of the mountain I found wonderful bushes of *Sutherlandia frutescens*, covered with beautiful red flowers. Then soon I came upon some fine *Stapelia* plants; there were not too many of them, but I got enough and they turned out to be an entirely new species, since named *Stapelia herrei*. While most succulents flower during spring, the Stapeliads re-

quire more heat and only flower after all the others are gone. As this particular species is a very interesting one, I looked for it again in 1933, but could not find a single plant in this locality. Fortunately I found it later near Steinkopf, some 30 or 40 miles away. While one can usually find Euphorbias, bulbs or Mesembryanthemums on the same spot where one has found them before, one cannot ever be sure about Stapeliads, the seeds of which are distributed by the wind, one here, another there. Nor will one find them easily, in the dark shade of the bushes under which they generally grow, which contrasts so sharply with the bright sunlight outside. Only if a bush has died and the plant grows alone, it will be easy to see it. I also saw some other Stapeliads here, including *Caralluma incarnata*, with its var. *alba*, and *C. hottentotorum*.

Leaving Stinkfontein in our donkey wagon we reached next day the steep little pass called the Remhoogte. Here I immediately found a huge

plant of a new *Stapelia*, *S. rubiginosa*, which later developed a quantity of very interesting flowers. Later expeditions showed that this species also occurs around Kliphoogte, where we passed before coming to Stinkfontein.

Next we came to the Karrachab Poort, the road through which is covered with stones. The name is quite appropriate, as the wagon-wheels make a noise among the stones which sounds just like: "Karrachab, karrachab!" On top of the hills through which we passed grows, under shrubs and bushes, the only *Duvalia* we found in the Richtersveld, *D. elegans* var. *namaquana*. In the large sandveld are to be found species like *Caralluma incarnata*, and it was not until we got to Anisfontein that we found *Stapelia pedunculata*, with its fine long-stalked flower. Further along the road between Numees, where there is a rich copper mine, and Sendlingsdrift, the Rev. Mr. Meyer and I were very excited to see a fine specimen of a new *Trichocaulon*, *T. kubusense*,

growing without any protection on a steep stone wall. It was a splendid specimen, much more showy than the smaller *T. pictum*, which I had previously found further south under bushes near Kliphoogte. We were fortunate to find some more plants of *T. kubusense* along this road, and when coming to Sendlingsdrift we gathered quite a lot of the smaller *T. cactiforme*, growing there under shrubs and also alone between stones. Best of all was *T. columnare*, a species unique among *Trichocaulons* and probably intermediate between the spiny-stemmed and the spineless ones, which I first discovered in only one single plant as I was returning from a very strenuous climb to the top of the high Kubus Mountain near Kubus. Later I found it frequent near the top of the Richtersveld Barrier. The pass there is very precipitous and dangerous, and hence it is called the Helskloof. Here is the real home of this very fine *T. columnare*, which grows in such a way that only some small parts



FIG. 1199

Stapelia rubiginosa Nel

In natural surroundings, Remhoogte, Richtersveld. Photo by H. Herre, Kakteen Jahrbuch, 1936.

of the stem, mostly those which bear the flowers, look out of the bushes. It does well in cultivation when kept dry and protected against the sun's rays. Here too we found the fine *Stapelia neliana*, a relative of *S. herrei*. Both are most beautiful, with their cup-like flowers, and belong to the most desirable species for every collector. It is a pity they are so hard to keep in cultivation and, like so many others, do not form seed-pods.

Elsewhere in the Richtersveld I came across *Stapelia namaquensis*, the finely colored Namaqualand equivalent of *S. variegata*, but with much bigger flowers. It has a beauty of its own! And last but not least, there was *S. hirsuta*, a plant of wide distribution, for it also grows in the Karroo (at Prince Albert, etc.) and in the mountains of the Western Province of the Cape. There were still others, not yet named; and surely others still remain to be discovered. All in all, the Richtersveld is a very interesting territory as far as Stapeliads are concerned.

Naturally, traveling in this part of the Union is not easy. One is always far from help, for

there are no farms or villages. Places like Lekkersing and Kubus consist only of a few huts, one small house for the teacher, while the school also serves as a church. The Hottentots, to whom the Richtersveld belongs as a reserve, are nomads and trek about wherever they can find grazing for the stock, wandering all over the Richtersveld. Kubus, once their capital, was quite deserted when I was there, but is now again the main village. It has a plentiful water supply running from the high mountains of the Barrier; but if one travels about for any length of time one must take along all one's food, besides water and petrol, as one cannot buy anything there. Only milk is to be had in exchange for coffee, sugar or the like, and that only occasionally, when one is fortunate enough to meet with some of the natives.

Needless to say, one's motor lorry must be in best running order. The one we used in 1929 was not, and it collapsed before we reached Stinkfontein. So we dug a pit to work on it from beneath, but, alas, the soil was wet and the



FIG. 1200

Trichocaulon columnare Nel

In natural surroundings at Helskloof, Richtersveld. Photo by H. Herre.



FIG. 1201

Kubus

Between the Church and the house of the teacher is seen the tent of Mr. Herre.
Expedition of September, 1930.

lorry fell into the hole, so we had to get some donkeys to haul it out. Happily one of the new white farmers, who are allowed to live in the reserve, was very glad to take us further with his old donkey cart. But even with eight donkeys, it was a slow progress and sitting in the cart was so uncomfortable that much of the way we walked alongside. Nevertheless I would not like to have missed the experience of traveling as did the old pioneers.

The Remhoogte and Helskloof are dangerous passes. The former is no more used, because it is too steep; but if one goes there in search of plants, one must perforce travel over it. On the Helskloof we twice nearly had an accident. Once the motor failed to make the grade, switched off and reversed, but fortunately the brakes held. The second time the lorry started rolling backward, but as it got into full swing a big stone by the roadside caught the wheel and stopped us.

Even so it cost us two hours of hard work to get back on the road.

Climbing in the high mountains is very strenuous, for besides food and water, one must carry on one's back all the plants collected. One must face constant heat and sandstorms, and the drifts of loose sand are very troublesome to cross. The worst road over which I ever traveled was the one between Helskloof and the Tatas mountains, behind the Richtersveld Barrier. In places the motor had to jump up onto little steps and backwards down again, and there were lots of stone ledges and ruts across the road, but our driver was equal to every emergency and we always managed to pull through. While going forward amid all these troubles, no matter how hot and thirsty, one must never relax from watching out carefully all around for plants, and when any are seen they must be gathered, photos taken in the natural environment, herbarium material

prepared, seeds and bulbs collected, and, last but not least, every step must be taken cautiously, so that one does not tread on the snakes, which are plentiful everywhere. And then one day one reaches the Orange River, where one finds every-

thing which one has been so long without, and best of all a bath! In spite of all one has to go through, whenever occasion arises I shall always be happy to return to the Richtersveld.



FIG. 1202

H. Herre (wearing helmet) and Rev. G. Meyer, alongside their donkey cart, near Stinkfontein.

A P P E N D I X G

VERNACULAR NAMES OF STAPELIADS IN SOUTH AFRICA

By David Pringle

(NOTE: The following list includes only a few of many popular names applied to the Stapeliads, and the origins suggested for some are merely conjectures).

- Aasblom* — (From Afrikaans: *Aas*, carrion, and *blom*, flower). Name applied generally to *Stapelias* and occasionally to other genera, just as the odious names, Carrion-flower and Toad-plant, are used in English. A recent incident suggests a more appropriate common English name for these wonderful flowers. A small boy romping in the garden came suddenly upon a flower of *Stapelia variegata* and exclaimed with glee, "What a pretty *butterfly*!"
- Aroena* — (Origin unknown, probably a Hottentot or Bushman word). Name used by the colored people, from the Clanwilliam district to Little Namaqualand, to designate *Caralluma incarnata* and other species.
- Bobbejaanseep* — (From Afrikaans: *Bobbejaan*, baboon, and *seep*, soap). Name given to the *Hoodias* and perhaps also to some *Trichocaulons*. *Bobbejaan*, an alternative word for *Baviaan*, the baboon, is probably here intended purely as a term of disparagement. It is a common thing in the country to find the word, *Bobbejaan*, prefixed to anything that is not good for humans. In the present instance the slimy inner texture of the stems of the *Hoodias* might suggest their use as a substitute for soap; but in reality they would prove unfit for human use, and hence would be relegated to the baboons.
- Bokboortjies* — (From Afrikaans: *Bok*, buck, and *boortjies*, small horns). A common name for all species, from the resemblance of the seed-pods to little horns. The words Deer and Antelope are not in general use in South Africa, both being known as *Bok* by the Afrikaans section and *Buck* by the English. Goats are referred to in a similar manner.
- Duikerboring* — (From Afrikaans: *Duiker*, small buck, and *boring*, horns). Another reference to the resemblance of *Stapelia* seed-pods to little horns. When disturbed, these buck appear to dive over and between the bushes, hence the name, *Duiker*, a diver. There are several kinds of *Duiker*. The Blue *Duiker*, or Blue-buck, is the smallest buck of the Cape Province, about 13 inches high at the shoulder, with horns up to 2½ inches long. The more common *Duiker* stands about 23 inches high, with horns up to 6 inches long. *Duikerboring* is a most appropriate name, as the follicles of all Stapeliads fall within the measurements of the *Duiker*'s horns.
- Haasoor* — (From Afrikaans: *Haas*, hare, and *oor*, ear). Popular name for species such as *Stapelia grandiflora*, whose corolla-lobes bear some likeness to the ear of a hare.
- Hotnotstoontjies* — (From Afrikaans: *Hotnots*, Hottentots, and *toontjies*, toes). An expressive name, covering most of the smaller Stapeliads, *Duvalias*, *Piранthus* and some species of *Huernia*.

- Kopseer* (From Afrikaans: *Kop*, head, and *seer*, sore). The name, Headache, picturesquely suggests the odor of some species, such as *Caralluma lutea*, to which it is usually applied. The Hottentots apply the name to *Stapelia pedunculata*, for they have learned by experience what to expect if they eat this bitter plant.
- Ngaap* (Bushman name of unknown meaning, pronounced with a characteristic Bushman click. Also spelled *Guaap*, *Ghaap* or *Gaap*). The name is primarily applied to the edible spiny-stemmed *Trichocaulons*, but modifications are used for other groups of Stapeliads. Some of the pubescent-stemmed *Stapelias* are *Slang Ngaap*, Snake gaap (see Appendix C). *Hoodias* are *Wilde Ngaap*, wild gaap; or they may be called *Baviaans Ngaap*, *Wolves Ngaap* or *Jackhals Ngaap*, terms of disparagement, as these plants are not considered edible, meaning Gaap fit only for baboons, wolves or jackals, all animals with a prominent role in native folk-lore.
- Ou Koei* (From Afrikaans: *Ou*, old, and *koei*, cow). Name in common use in the Ladismith division to denote *Caralluma ramosa*. Its origin is uncertain.
- Ou Ram* (From Afrikaans: *Ou*, old, and *ram*, male sheep). Name applied only to *Caralluma pillansii*, the odor of the flowers presumably suggesting the presence of a Merino Ram. *Ou*, in Afrikaans, often has an affectionate connotation, comparable to the English use of the word in the expressions Old Top, Old Dear, etc.
- Skilpadkos* (From Afrikaans: *Skilpad*, tortoise, and *kos*, food). Name given without distinction to many Stapeliads.
- Slangkos* (From Afrikaans: *Slang*, snake, and *kos*, food). The reputed fondness of snakes for *Stapelias* seems to be at least in part of legendary origin. The frontispiece to Vol. 1 of this book illustrates the hold which this legend has on the mind of the artist.
- 'ilko* (From Afrikaans: *Uil*, owl, and *kos*, food). The belief that *Stapelias* are eaten by owls may have arisen from the habit these wise birds have, in winter, of resting on the east or sheltered side of bushes, where *Stapelias* are often found. Damaged plants, however, have more probably been the victims of land turtles, game or domestic livestock. But on occasion it is not unlikely that the owl, like the blow-fly, has been deceived

The frequent use of the Afrikaans word, *Kos*, food, as a part of the local names of Stapeliads, seems to imply that they constitute an important food supply of many animals and some birds, and some observers have assumed that this was actually the case. But, on the contrary, they are probably eaten only in extremely dry periods, when other food and even water is unobtainable, the moisture in their stems being at such times much in demand.

The frequent reference to Stapeliads as the food of certain animals, by the colored people, is more properly to be taken as a form of disparagement. These people have always led a

precarious existence and food is the main subject of their anxiety. They take little interest in what is not edible for themselves and, when questioned about plants which they do not personally relish, their invariable reply is: "Oh, that is Baboons, snakes, owls, or such likes, food;" not that these creatures eat it, but that it is of little value.

Under the pressure of necessity the Stapeliads may to some extent be used as food also by the colored people, who subsist, in the arid regions, almost entirely on bread and meat. Fruit and green vegetables, and even the humble potato, are practically unknown. The lack of carbohy-

drates stimulates an extraordinary appetite for sweets in all inhabitants of the arid sections, and it is reasonable to suppose that they may find in the Stapeliads a source of mineral salts and vitamins.

In this connection a quotation from a letter of Redmond Orpen of Kleinsee, Little Namaqualand, will be of interest. He writes: "I have eaten plenty of *Stapelias* of one or two varieties. If you know which kinds to look for and select only the very newest of the vingertjies (little fingers)—still only a pale green above ground and blanched below—you will find that they have a pleasant sweetish taste, with a slight suggestion

of licorice flavor about it. These are certainly very much relished by children and by natives. They are called 'Ga, with a good ripe click, or 'Gapies, by the natives.

"When one speaks of *Stapelias*, the image presented is of the marvelously beautiful flower with its terrible odor, which no one but a blow-fly could well relish. My brother used to say that he had often wondered whether the early visitor to the Cape, who so positively stated that "South African flowers have no scent and the birds no song," had ever

"Smelt an *Aasvoel*, or heard a *Stapelia* hum." (The *aasvoel* is the South African vulture).

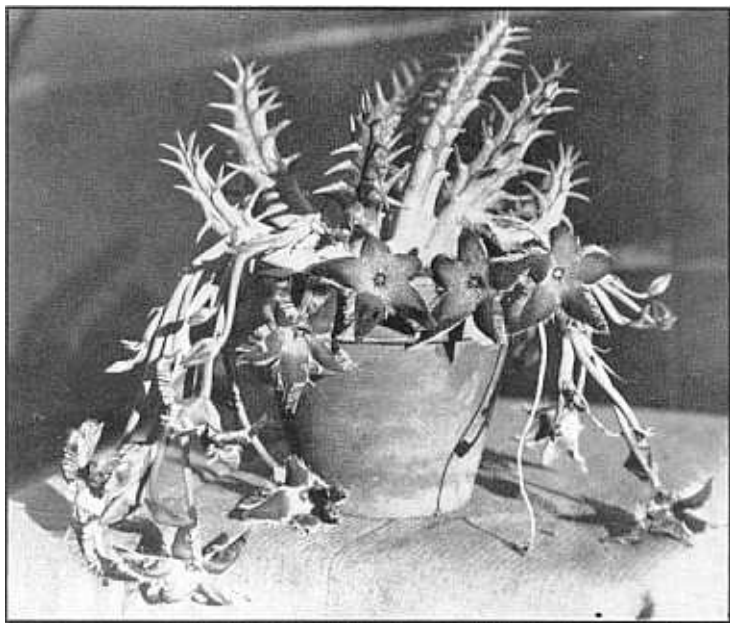


FIG. 1203

Stapelia marientalensis Nel

Photo by W. Triebner.

APPENDIX H

CULTURAL NOTES

In general, the cultivation of the STAPELIEAE is neither a difficult nor a complicated matter. With this group of plants as with any other, the achievement of satisfactory results will be in proportion to the amount of intelligent care given them. Let it be kept in mind that plants are living things and should be treated as such. That very valuable quality known as "plant sense," by which one naturally cares for his plants in "just the right way," brings rich rewards to him who possesses it.

Before considering the care of the various genera, the three methods of propagation—raising from seeds, cuttings and grafting—will be explained.

The first of these three methods is, perhaps, the most interesting. It has its advantages and disadvantages. As stated earlier in the book, most of the STAPELIEAE have their habitat in South Africa and all of them come from the Eastern Hemisphere. Because of this fact, importation of plants into this country is not an easy matter. To protect United States plant life from pests which might be brought in from other lands, rigid quarantine regulations have been set up by the Federal Government. Special permits are necessary for importation and are given only upon the most satisfactory reasons being presented. Then, too, the time involved very often makes importation most unsatisfactory. Plants coming from India or South Africa may be from ten to twelve weeks in transit and when the package is opened those "smallest plants capable of propagation," as specified by the Government, may be nothing but the dried remains of what were once healthy specimens.

But why import from foreign countries? Until very recently there seemed not to be a nursery where more than a dozen species could be purchased. One could buy plants of many names, but their being true to name was a different matter. Of over forty plants of the Orbea

group purchased under different names, less than a half dozen were true to descriptions.

RAISING FROM SEEDS

One difficulty in making a collection by raising from seeds, is the limited number of species from which seeds are available. Scarcely a seed catalog, either foreign or domestic, will list more than twelve or fifteen varieties. Indeed, some species in cultivation never have been known to set seeds. Ernst Rusch has had a plant of *Stapelia ruschiana* in his garden in South Africa for several years and it never has set seeds. Some species are easily hybridized and one may never be quite sure whether his plants from seed will come true. Here is where the interesting element of chance enters. There is always the possibility of a delightful hybrid developing. One may have stray seeds among those purchased. A plant nursery in San Diego discovered one plant in a seed pan unlike the others. Upon flowering it was discovered to be *Caralluma marlotbii*, the only known plant of its kind at that time in the United States!

The length of time from seed planting to maturity can scarcely be called a drawback. Most cuttings require a year's growth before satisfactory flowers can be expected. Many of the faster growing varieties flower within a year from the planting of the seeds. When properly cared for, the growth is very rapid. The fresher the seeds, the better the chances of germination. *Stapelia* seedlings have been known to appear above the surface within twenty-four hours from the time of planting the seeds. Conditions of heat and moisture were just about perfect in this instance. Some seeds retain their vitality for a long period. However, delay in planting is not advised. When the seeds are old, the period of germination will be longer and the number of seedlings which can be expected will be fewer.

The directions given here are those followed



FIG. 1204

Year-old Seedlings

REAR ROW: (Left to right) *Caralluma baldratii*, *Stapelia kwebensis* var. *longipedicellata*, *Stapelia grandiflora*. MIDDLE ROW: *Stapelia grandiflora*, *Hoodia gordonii*, *Trichocaulon officinale*. FRONT ROW: *Hoodia gordonii*, *Huernia macrocarpa*, *Caralluma baldratii*.

by the White and Sloane Stapelia Collection, Pasadena, California. Southern California climate is well suited to the growth of this branch of the succulent family. These directions may be modified to suit any locality, provided due precautions are taken against frost and excessive moisture. Let it be emphasized here that proper drainage for seedlings and mature plants is perhaps the most important item to be considered in the growing of these plants.

For seed planting, seven-inch pan-shaped flower pots are used. New ones are first soaked in water that later they may not take the moisture from the soil. They are filled about one-third with quarter-inch crushed rock. Over this is placed a thin layer of what is known at seed stores as "green moss." A soil mixture of approximately one-third good garden loam, one-third *very well rotted* leaf mold, one-third coarse sand and a plentiful sprinkling of crushed charcoal is added to within an inch of

the top. The seeds are then scattered or placed in neat rows as one prefers. They are covered to a depth of about one-eighth inch with sand which has been screened through mosquito netting. The pots are set in a pan of water from which the chill has been taken until the sand covering the seeds has been dampened by water soaking up through the bottom. Remove the pots from the pan and permit the excess water to drain off. Experience has shown that the safest way to avoid the mixing of names is to write the name of the plant on the side of the pot as soon as the seeds are planted. A number may be used instead, providing one is careful to record the correct number opposite the proper name in his notebook.

After planting, one of two general methods may be followed. The seed pan may be covered with a pane of glass and placed in a warm room. When the seedlings begin to show, the proper amount of air must be provided. Avoid placing

the glass-covered seed pan in the direct sunlight unless the glass be covered with a thin cloth or whitewashed. Otherwise the young plants will be scalded. Be careful not to let the seed pan dry out at any time until germination is completed when the danger is not so great.

Where a number of seed pans are prepared at the same time a second method may be more desirable. After planting, the seed pans are placed in an "incubator." This is nothing more or less than a box 3 feet long, 2 feet wide, and 2 feet deep. The top is covered by glass and there is a shelf ten inches from the top, covered with wire, upon which the pots are placed. Sufficient heat is furnished by electric light bulbs placed in the bottom to keep the temperature between eighty and ninety degrees.

Care must be taken so to arrange the bulbs that they do not rest on the wooden floor of the box. Neither must they be too close to the seed pan. With a recent planting, the bulb was placed in a flower pot on the floor of the box and it was found that it gave ample protection from fire. A small sheet of tin should be placed on the shelf immediately above the bulb in order that the pot above does not become too warm. The size of bulbs necessary will depend upon the size of the box used and upon the outside temperature. If the temperature inside the box becomes too warm, it may be regulated by sliding back the glass top. Only experimentation can determine one's needs. At night the top may be covered with cloth or newspaper to prevent loss of heat by radiation. As in the case of a single seed pan, the glass must be covered with cheesecloth or whitewashed in order that the temperature in the box does not rise too high and scald the seedlings. It is wise to keep a thermometer resting on top of the seed pans so that the temperature may be watched. When the seedlings show themselves, raise the glass slightly to permit the circulation of air.

As stated before, the soil should not be allowed to dry out during the germinating period and even when the seedlings are well on their way, the growth will be more even if proper attention is given to watering. They can be

watered by again placing in a pan of water or from the top. In the latter method, extreme care must be taken not to wash the seeds or seedlings from the soil. A bottle spray has been found handy in dampening the sand. To insure against fungus diseases and to prevent what is known as "damping off," the surface of the seed pan may be sprayed with a solution of Semesan.

In two or three weeks the seed pans may be removed from the incubator. Then they are placed in the glass-house and in about twelve weeks, if well cared for, the seedlings should be large enough for individual pots. Three-inch pots are used for this purpose. To improve the drainage, the holes in the bottoms of the pots are enlarged by being tapped out with a hammer or trowel. A layer of green moss is placed over this opening and the pot filled to within a half-inch of the top with the soil mixture mentioned above. Do not pack the soil in the pots. When ready to use, the soil should be just damp enough to barely hold together when a handful is taken. Packing prevents good drainage and does not permit a proper circulation of air about the roots. It is well not to use overly large pots for seedlings otherwise the roots will be too far from the edge of the pot and will not secure sufficient air. The seedlings may stand a day after being potted and then be given a good watering. After this, a few days should elapse before watering again. Seed planting and potting is best done in clear weather. Watering in cold or rainy weather is not advised. Keep the young seedlings warm and you will have continuous growth.

PROPAGATION BY CUTTINGS

This method is by far the easiest and when plants do not set seed it is the only way in which new plants may be started. As in seed planting, the warm season of the year is the most desirable one in which to grow plants from cuttings. In making the cutting, the stem or portion of plant one wishes to use should preferably be removed at the joint or point where it is joined to the parent stem. Dust both cut places with flowers of sulphur. While not absolutely necessary, this

helps to prevent infection of the cut stems. Sulphur may be obtained from any druggist. After removing the cutting, it is allowed to lie until the cut place has dried. It may remain unplanted for several days and no harm will be done. A cutting of *Huernia hystrix* lay from November till May and readily rooted when planted. When ready to plant, place the cutting with the cut end down in clean river sand. From a half-inch to an inch and a half is usually a sufficient depth. Some *Duvalias* need only be laid on the sand. Sea sand should under no circumstances be used. The sand should be kept moist—not wet—and warm. In a few days roots will begin to appear. When the roots become an inch or two long the cuttings may be removed and placed in pots. It is sometimes advisable to place sand immediately under the cutting when planting in soil.

Occasionally a stem becomes broken from a plant or the cutting rots when taken at the joint. It is not necessary to discard these pieces. Cut off the broken or rotted portion with a clean, sharp blade—old safety razor blades are excellent—dust with sulphur, allow to dry and plant. A plant from South Africa in the Collection rotted at the root and each stem persisted in rotting no matter how often it was cut and planted. Finally but one stem remained. Instead of planting the end of the stem, it was placed on its side on moist sand with the cut end out of the sand entirely and lo! it rooted. Given half a chance, most cuttings will root.

GRAFTING

Grafting is the union of the stem of one plant with that of another. It is commonly used in those cases where a plant does not do well on its own roots or where stems are too small or too weak to risk trying to root them. Some valuable imported material has been saved by grafting. A few years ago some *Trichocaulons* came in from Germany. One, *T. dinteri*, was decayed and only an inch of good stem remained. A clean razor blade removed the decayed portion with one cut. A common *Stapelia comparabilis* was selected as the stock upon which to graft.

The stem was cut about an inch above the soil and the *Trichocaulon* piece placed upon

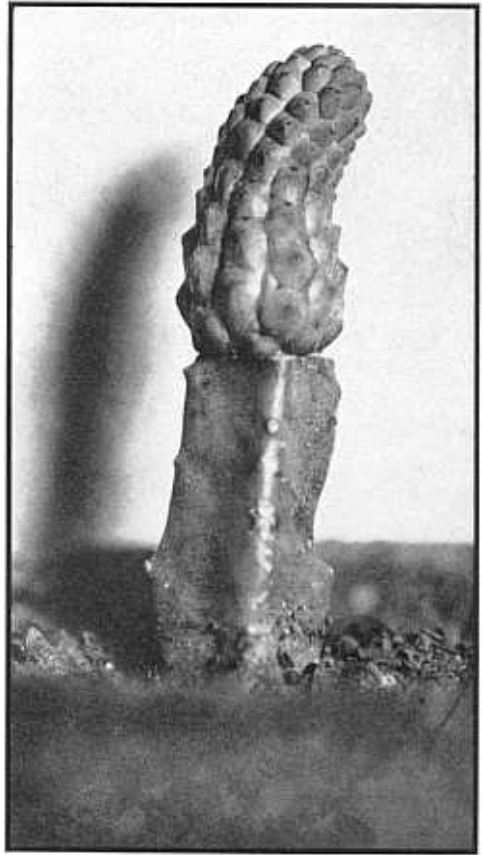


FIG. 1205

Illustrating a horizontal or "straight" cut graft.
Trichocaulon on *Stapelia*.

the stock and pressed down firmly. Today it has grown to be a beautiful specimen almost a foot tall.

A shipment from South Africa brought a forlorn looking *Duvalia*. The tiny pieces looked much too small ever to root in sand. One bit was grafted on an *Orbea* stem and another planted in sand. Both grew. The grafted piece today is ten times larger than the piece growing on its own roots. A third example will suffice. A bit of *Stapelia virescens* imported from Africa rooted, grew an inch or two in a year and then remained stationary for several months. Examination showed that it had rotted at the base. The stem

which remained was much too small to risk trying to root it. It was grafted on an *Orbea* stem and in two weeks had begun to put out a new shoot from the side. Some genera, especially *Ta-*

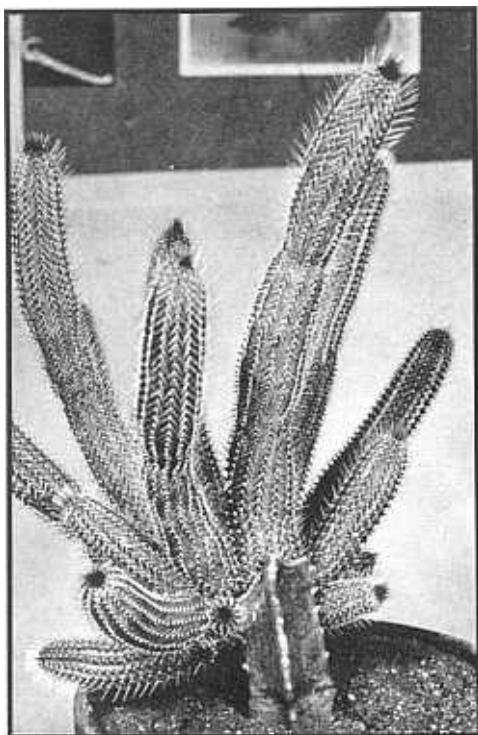


FIG. 1206

Illustrating oblique cut graft. *Tavaresia* on *Stapelia*.

taresia, grow much more luxuriantly on *Stapelia* roots than on their own.

Grafting may be by the flat or oblique method. The former consists simply of a straight cut across the stem. In this type it is best to wait for a moment or two after the cut has been made to allow the excess sap to escape before joining the parts. Remove this excess sap, make the union and hold the pieces together for a moment. Dusting the union with sulphur helps to guard against infection. It is best to use a stock—the stem upon which one is going to graft—of about the same diameter as the graft. A clean, sharp blade should be used. Keep the plant out of the bright sunlight a few days after grafting. If the stock contains side shoots they should be re-

moved after the graft becomes established and new shoots on the stock should be removed as they appear. With this type of grafting one may at times have to devise ways of tying the pieces together until the union has healed. Experimentation is necessary to insure the proper form.

A second method, and one used successfully by a dealer in the East, is the oblique method. In this the cut is made on a slant instead of straight across. It has an advantage in that the stems united may be fastened by inserting a spine of *Opuntia subulata* or *Opuntia vulgaris* through the joined parts. *Stapelia gigantea* makes a good stock for the larger stemmed varieties and *Sta-*

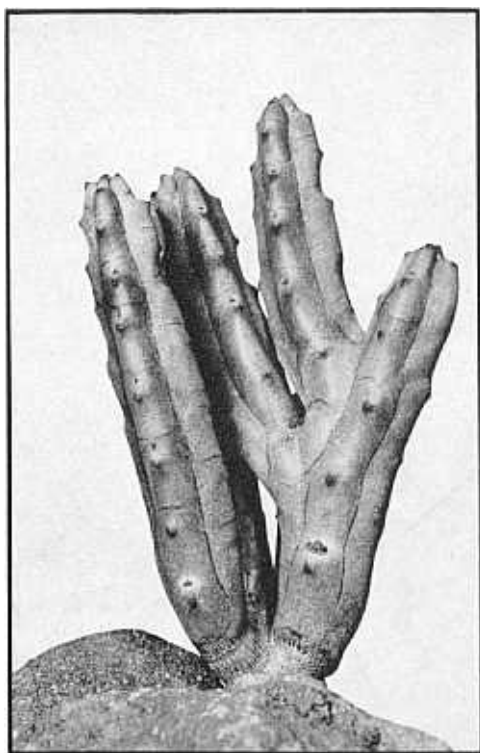


FIG. 1207

Caralluma ramosa N. E. Br.

Showing how grafting on a low cut stalk tends to give a natural appearance to the plant.

pelia variegata for some of the smaller ones.

The warm season, when plants are in their best growing condition, is the proper one for grafting. However, one cannot always have the proper season when he is about to lose a valu-

able plant. A *Tavaresia grandiflora* was saved in January by grafting. The union healed but the graft made no new growth till the warm season came.

PESTS

The indoor growing of the STAPELIEAE requires an ever watchful eye to prevent infestation of plants by insect pests. The so-called "mealy bugs" and red spiders are the two most likely to be found. If the old saying, "An ounce of prevention is worth a pound of cure" were ever true, it certainly is where the glass-house is concerned. A good rule to follow is never to take for granted that any plant is clean, no matter what its source. Examine it thoroughly and keep it under surveillance until you are sure it harbors no insects. Many claim that mealy bugs do not exist unless there are ants about. Experience does not prove the correctness of this statement. If one finds a little oval insect that looks as though it were covered with cotton, he can be quite certain that he has found a mealy bug. If these little fellows fought in the open, the battle would be easier. They thrive underground as well as above and attach themselves to the roots of the plants, sucking the very life blood from them. If one has mealy bugs and finds a plant beginning to turn yellow or to wither without apparent cause, look for mealy bugs on the roots. They may be got rid of by washing the soil from the roots and dousing briskly up and down in a pan of denatured alcohol or cutting off the roots and rerooting. The latter requires less labor and is less expensive. Catch the bugs above ground. Some of the more common sprays are ineffective against these insects because of their waxy covering. To be effective the spray must penetrate this coat.

The one successful method of keeping the houses free of mealy bugs which was finally adopted is that of regular fumigations of the houses with granular calcium cyanide—the commercial cyanogas. This not only kills the bugs, but seems to have a stimulating effect upon plant growth. While this chemical is recommended only when used under the direction of a quali-

fied person, some cautions and general directions are given.

Fumigation with cyanogas should be done only on clear, calm evenings. The plant stems and top soil should be dry. If the stems are damp, burns will result. This will show as whitish places on the tips of the stems. Trichocaulons are especially liable to burn. The reader is especially cautioned against using this method for any other type of plants except the STAPELIEAE unless he obtains specific directions for doing so. With the plants in the proper condition, and the house closed tightly, one ounce of cyanogas for each thousand cubic feet of air space in the glass-house may be spread on dampened newspaper placed in the walks of the house or on the soil of the walk itself. Keep the house closed till the following morning. If the evening be cool, slightly more chemical may be used. Weekly fumigations will keep the house free from most insects. However, fumigation has no effect on red spider.

Look for red spider if the young growth on one's plants looks gray or sometimes brown. These tiny red insects sometimes cannot be seen except with a lens. They, too, suck the vital juices from your plants. A dry atmosphere and dry soil are conducive to the growth of this pest. They may be washed off with a spray from the garden hose but this does not kill them. Dusting the plants with flowers of sulphur through two or three thicknesses of cheesecloth is an effective remedy.

Occasionally a plant may show black spots on the stems. This is sometimes caused by a fungus. One very badly affected plant of *Stapelia comparabilis* was cleaned by spraying with a solution of Semesan. The spots disappeared and have never returned.

GENERAL CARE

Now a few words as to the general care. Good drainage is again emphasized. Dry plants will stand much colder temperatures than wet plants. Protect against frost. The Trichocaulons, Tavaresias, Hoodias and Pectinarias are more susceptible to over-watering than the other genera.

In fact, during the colder months these types should have very little water. In summer the plants should be watered frequently enough to stimulate growth. It is best not to permit the pots to dry out enough to cause the plants to wilt.

Excessive watering and too much shade cause the plants to grow straggling unnatural stems. Occasionally a plant which ordinarily branches only from the base may throw out new stems from the top of a stem several inches high.

Most of the plants in the Collection are grown in partially shaded glass-houses. The *Stapelias*, many of the *Huernias*, some of the *Carallumas* and the *Duvalias* will thrive out of doors in Southern California. Plants grown indoors lose much of that delightful mottled coloring of the stems which they show when grown in the open.

Experimentation may be necessary with plants in the glass-house to determine the best location in order to get some plants to flower. All buds blasted on a *Stapelia gemmiflora* when it was placed on a shelf above the bench or on the bench. Only when it was placed upon the floor did any buds mature. Caution should be used in moving plants in bud. Many buds are caused to blast by the unnecessary moving of the pots or touching the stems by admiring visitors.

An adaptation of the above suggestions in accord with the climate of one's particular locality should enable the admirer of the *Stapeliads* to grow these interesting plants without serious difficulty.

STAPELIA CULTURE IN TEMPERATE CLIMATES

By LADISLAUS CUTAK, *in charge of Succulents, Missouri Botanical Garden, St. Louis.*

Most of the directions given by Mr. B. L. Sloane for the culture of *Stapeliads* in the dry hot climate of California will hold equally well for the Middle West and other temperate regions everywhere; but there may be a few modifications required by the conditions of greater dampness and colder weather prevailing with us, especially in winter.

Nearly all *Stapeliads* are liable to rot away

suddenly if subjected to continued dampness without compensating periods of dry heat. In particular, if weakened by improper care in winter, they are prone to die off at the return of spring.

During the summer the plants will respond to frequent watering by a fuller growth and freer flowering, providing drainage is always ensured and the plants are kept in the sunniest position available. But from November to March, they should be allowed to rest and water should be applied with moderation and only when really needed. In greenhouse culture a good sprinkling once a week is sufficient; in the home, watering the pots from below is the best method, and this should be done not more than once in every week or ten days, depending on the room temperature. The plants should never be exposed to continued damp draughts.

The drainage of the plant roots should always be watched and plants should be repotted at least every two years. A good soil for potted plants may be formed of equal parts of garden loam, well decomposed leaf-mold and sand. A noticeable character of nearly all the species is their preference for limestone, especially of the honeycomb variety, if planted out in a conservatory. In pot culture this can be duplicated by placing limestone chats around the base of the stems. Many *Stapeliads* thrive if placed in Wardian cases, provided humidity is regulated by leaving an inch of space between the glass cover and the opening, so that air may have free access at all times.

Seeds will germinate at any season of the year, but seed planting should not be attempted during the fall or winter months, because the seedlings remain tender for several months and are apt to succumb to the "damp-off" disease on the cooler, cloudier winter days. The seeds remain viable a long time, and can be kept over and planted with the return of warm weather in the spring. Germination usually occurs in between one and two weeks. The seedlings should be kept in a temperature of at least 70° Fahrenheit and watering from below every fifth to seventh day until they have become well es-

tablished is amply sufficient.

Most Stapeliads respond readily with us to propagation by cuttings and many will strike root even if just laid on some sandy soil. Cuttings, however, need not always be rooted in sand. They can be placed immediately in a mixture of one part good garden loam, one part well rotted leaf-mold and two parts clean sand. Water

must be withheld for at least two weeks, after which light sprinklings will suffice until new shoots begin to make their appearance.

The main points to bear in mind at all times are to give the plants all the dry heat and sunlight available, to avoid cold damp air, and to allow sufficient winter rest for the plants to resume a normal vigorous growth in the spring.

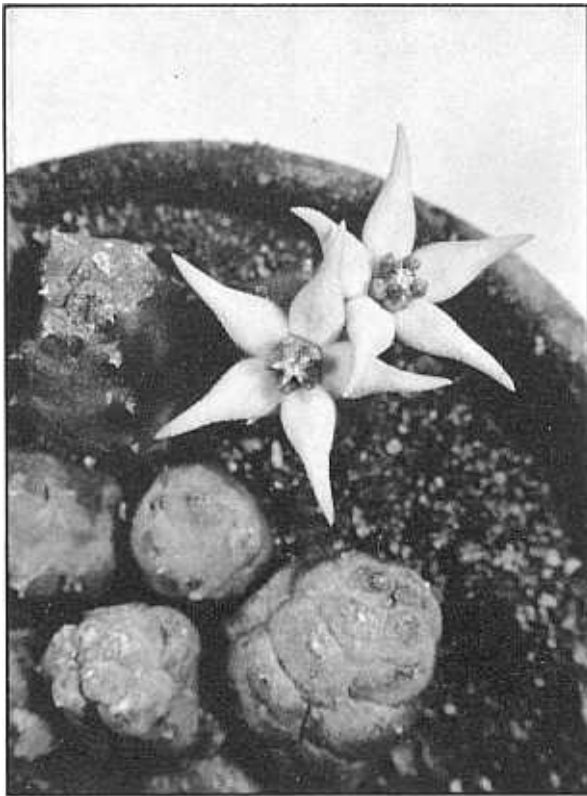


FIG. 1206-A

Piaranthus pallidus Luckhoff

APPENDIX I

LATIN DIAGNOSES

The regulations of the International Botanic Congress, 1935, require the publication of a Latin diagnosis for new varieties, as well as for new species, of plants. The following provide for cases which are not covered elsewhere in the text.

Caralluma caudata var. *fusca* Luckhoff, var. nov.

A typo recedit corolla tota saturate purpurea.

Caralluma hottentotorum var. *minor* Luckhoff, var. nov.

Varietatis novae corolla coronaque quam illae typi minores.

Caralluma hottentotorum var. *tubata* Luckhoff, var. nov.

Varietatis novae corona, corolla, et corollae tubus praesertim, valde majores quam illae typi et varietatum omnium.

Caralluma lateritia var. *stevensonii*, var. nov.

Floribus majusculis, 12.5 cm. excedentibus, pro *Caralluma* maximis, a typo dignoscitur.

Caralluma nebrownii f. *intermedia*, f. nov.

Corollae maculae medium tenent inter eas typi et varietatis *pseudo-nebrownii*.

Caralluma nebrownii var. *discolor* Nel, var. nov.

Differt a typo colore luteo.

Caralluma pruinosa var. *nigra* Luckhoff, var. nov.

A typo differt corolla tota facie interna nigerrima.

Duvalia elegans f. *magnicorona*, f. nov.

Corona exterior, distincte lobata, valde corollae annulum excedit.

Duvalia maculata var. *immaculata* Luckhoff, var. nov.

A typo distinguitur corolla tota saturate purpureo-brunnea, annulo immaculato.

Duvalia polita f. *intermedia*, f. nov.

Forma nova medium tenet inter typum et var. *transvaalensem*.

Echidnopsis framesii, nom. nov.

Species adhuc pro *Caralluma tessellata* habita, ad *Echidnopsem* pertinet caulibus ipsis tessellatis.

Nomen, *Echidnopsis tessellata*, prioritatem temporis caret, ergo nomen novum est sumendum.

Hoodiopsis triebneri var. *ciliata* Luckhoff, var. nov.

A typo differt corollae lobis ciliatis.

Huernia brevirostris var. *bistrionica*, var. nov.

Corollae faciei internae maculis rarioribus a typo recedit.

Huernia brevirostris var. *parvipuncta*, var. nov.

Corolla tota facie interna maculis minutis insignita a typo dignoscitur.

Huernia keniensis var. *molonyae*, var. nov.

Corolla facie externa haud verruculosa, facie interna haud papillosa, pilis raris tantum praedita, a typo separatur.

Huernia macrocarpa var. *cerasina*, var. nov.

Varietatem *penzigii* arcte tangit, differt autem colore corollae cerasino.

Huernia macrocarpa var. *flavicornata*, var. nov.

Varietatem *schweinfurthii* simulat, lobis coronae interioris centro pulchre luteis differt.

Huernia verekeri var. *stevensonii*, var. nov.

Lobis coronae exterioris evolutis a typo differt; lobus quisque centro emarginatus in segmenta dua late ovata dividitur.

Piранthus disparilis var. *immaculatus* Luckhoff, var. nov.

Corolla tota pallide lutea a typo distinguitur.

Stapelia dummeri var. *glabra* Bally, var. nov.

Floribus perglabris a typo dignoscitur.

Stapelia longipes var. *namaquensis* Luckhoff, var. nov.

A typo recedit coronae interioris lobis ad apicem late clavatis, processibus angularibus praeditis.

Stapelia neliana, nom. nov.

Nomen requiritur novum, quia nomen adhuc habitum, *S. tigrina* Nel, 1933, prioritatem temporis caret.

Stapelia parvipuncta var. *truncata* Luckhoff, var. nov.

A typo coronae exterioris lobis truncatis vel parce emarginatis, neque subulatis, recedit.

Stapelia pillansii var. *fontinalis* Nel, var. nov.

A typo colore luteo differt.

Stapelia stultitoides Luckhoff, nom. nov.

Nomen adhuc habitum, *S. beukmanii* Luckhoff, 1935, prerogativa temporis caret, ergo nomen novum est sumendum.

Stapelia surrecta var. *primosii* Luckhoff, var. nov.

Corollae facie interna glabra, saturatius lutea a typo dignoscitur.

Tavaresia grandiflora var. *recta* van Son, var. nov.

Varietas nova, e Transvaalia, a typo recedit corolla haud curvata. In speciminibus omnibus typi ex Africa Austro-meridionalis corolla curvata invenitur.



FIG. 1207-A
Stapelia semota N. E. Brown
 Photo by Scott E. Haselton



FIG. 1207-B
Stapelia semota N. E. Brown

APPENDIX

GLOSSARY

Acuminate.	Long-pointed, tapering to a point.
Acute.	Sharply pointed.
Adnate.	Growing together, as of unlike parts.
Adpressed.	Same as appressed.
Annulus.	A fleshy ring, as the cushioned swelling of the corolla disk in certain Stapeliads.
Anthers.	The pollen bearing organs, which, in the Asclepiadaceae, are imbedded in the upper portion of the staminal column.
Anthesis.	The full expansion of the flower.
Apex.	The tip or point.
Apiculus.	A minute, distinct tip or point.
Apiculate.	Tipped with an apiculus.
Appressed.	Pressed close upon.
Arcuate.	Bent to the shape of a bow.
Arista-like.	Awn-shaped, like the bristle or beard of oats, grasses, etc.
Aristate.	Having a pointed spine-like tip.
Attenuate.	Becoming more slender.
Awn.	The bristle or beard of oats, or any similar bristle-like point.
Axil.	A point on a stem from which another stem or a leaf may branch.
Axillar.	Arising from an axil.
Bicornulate.	Having two small horns.
Bifid.	Cleft into two segments.
Bracteole.	A diminutive bract.
Bracts.	Modified leaves or scales at the base of the pedicel.
Calyx.	The outer envelope of a flower, composed in the Asclepiadaceae of five sepals.
Campanulate.	Bell-shaped.
Canaliculate.	Channeled or grooved.
Capitate.	Having the tip enlarged or rounded.
Carinate.	Keeled.
Caudicle.	A slender process to which the pollen-masses of certain plants are attached.
Cauline.	Pertaining to, or arising from, the stem.
Cespitose.	Also spelled <i>caespitose</i> : tufted, as of many stems growing together from entangled roots.
Channeled.	Grooved.
Cilia.	Marginal hairs.
Ciliate.	Fringed, bordered with hairs along the edge.
Circinnate.	Rolled inward from the apex into a coil.
Clavate.	Club-shaped, thickened towards the top.
Concave.	Having a curved surface, as seen from within the curve; opposed to <i>convex</i> .
Confluent.	Flowing together so as to blend into one.
Conical.	Round and tapering to a point, in the form of a cone.
Connate.	United.

Connivent.	Bent inwards so that the points meet or converge.
Contiguous.	In actual contact, adjacent.
Convex.	Having a curved surface as seen from outside the curve; opposed to <i>concave</i> .
Corolla.	The inner envelope of a flower which, in the Asclepiadaceae, surrounds the corona and the staminal column.
Corona.	In the Asclepiadaceae, the crown-like organ arising from the staminal column, at the base of whose lobes the plant nectar is usually secreted.
Crenate.	Scalloped.
Crenation.	A rounded marginal tooth.
Crenulate.	Minutely crenate.
Cuneate.	Wedge-shaped.
Cupular.	Shaped like a little cup.
Cuspidate.	Terminating in a sharp rigid point.
Cylindric.	Shaped like a cylinder or uniform round column.
Cyme.	A flower cluster usually convex or rounded in outline.
Decumbent.	Prostrate, but tending to rise at the apex.
Deflexed.	Bent downwards.
Deltoid.	Shaped like the Greek letter Delta, triangular.
Dentate.	Toothed.
Denticle.	A small tooth, often referring to the projecting points at the base of the teeth on stems of <i>Duvalias</i> and certain other Stapeliads.
Denticulate.	Notched into little tooth-like projections.
Depressed.	Appearing flattened or pressed down from above.
Dichasial.	Forking, said of pedicels subdividing progressively from a common peduncle.
Discrete.	Separate, not confluent.
Disk.	The united central part of the limb.
Distally.	Away from the point of origin, as towards the apex of the stem.
Divaricate.	Widely diverging.
Dorsal.	Situated at the back.
Dorsum.	The back.
Echinulate.	Beset with small spines.
Emarginate.	Having a shallow notch in the margin at the apex.
Endemic.	Restricted in distribution to a particular locality or country.
Equilateral.	Having sides of the same length.
Erose.	Irregularly toothed or jagged, as if gnawed.
Exserted.	Protruding.
Extra-axillary.	Arising from some point on a stem other than an axil.
Falcate.	Bent like a sickle.
Fascicle.	Cluster.
Ferruginous.	Rust-colored.
Fibritle.	Slender, threadlike.
Filament.	The part of a stamen supporting the anther.
Filiform.	Thread-like, very slender.
Flaccid.	Soft through lack of firmness.
Flagellum.	A flexible, whip-like shoot or process.
Foliar.	Leaf-like.
Follicle.	Seed-pod of certain plants, including Stapeliads.
Fuscos.	Dusky colored, blackish-brown.

Fusiform.	Spindle shaped, tapering at both ends.
Geniculate.	Shaped like a bent knee.
Gibbosity.	A convex swelling.
Gibbous.	With a convex swelling on one side.
Glabrous.	Without hairs.
Glandular.	Containing glands.
Glaucouscent.	Somewhat glaucous in appearance.
Glaucous.	Covered with a bloom; where referring to color, dull green passing to greyish-blue.
Globose.	Spherical, or nearly so.
Glomerate.	Densely clustered.
Granulate.	Covered with small grain-like particles.
Gynostegium.	Staminal column.
Herb.	A non-woody plant.
Hexagonal.	6-sided.
Incumbent.	Leaning upon.
Indurated.	Hardened.
Inflexed.	Bent abruptly inwards.
Inrolled.	Curled inwards on itself.
Intersepalar.	Located between the sepals.
Keeled.	Having a longitudinal ridge, like the keel of a boat.
Labyrinthine.	Winding intricately.
Lamella.	A thin plate or scale.
Lanceolate.	Lance-shaped, rather narrow and tapering to a point.
Ligulate.	Strap-shaped.
Limb.	In the Asclepiadaceae, the spreading part of the corolla outside the central tube (where there is one), formed of a united portion, the disk, and a divided portion, the lobes; sometimes used as equivalent to the united portion only.
Lingulate.	Tongue-shaped.
Lobes.	Segments, as those of the corolla or the corona.
Longitudinal.	Running lengthwise.
Marcescent.	Withering without falling off.
Median.	Running down the center.
Membranaceous.	Thin and rather soft or pliable.
Mucro.	A short stiff point, as of a corolla lobe.
Mucronate.	Tipped with a mucro.
Ob-	Adjectives thus prefixed become qualified in the sense of inversely, upside-down, etc. Thus <i>obconical</i> means shaped like a cone, but with the point down; <i>obovate</i> means inverted ovate; <i>oblanceolate</i> means lanceolate, but tapering towards the base rather than towards the apex.
Orbicular.	Spherical; circular.
Ovate.	Egg-shaped.
Papilla.	A prominence or projection of the corolla or other tissue.
Papillate.	Covered with papillae.
Papillose.	Somewhat papillate.
Pappus.	A downy tuft of hairs; the word being derived from the Greek, pappos, grandfather, in allusion to his grey hairs.
Pectinate.	Toothed like a comb.

GLOSSARY

Pedicel.	The stalk which supports one flower, either solitary or one of several divisions of a common peduncle.
Pedicellate.	Furnished with a pedicel.
Peduncle.	The stalk of a flower-cluster from which grow the pedicels of the individual flowers.
Pedunculate.	Growing out of a peduncle.
Pellucid.	Transparent.
Pendulous.	Hanging.
Pentagonal.	5-sided.
Pilose.	Covered with soft hairs.
Pollen-carrier.	In the Asclepiadaceae, a pincer-like mechanism fastened to two pollen masses, which serves to attach the pollen to visiting insects.
Pollen masses.	In the Asclepiadaceae, the waxy bodies into which the grains of the pollen are united.
Process.	A marked prominence or projection of the corolla or other tissue.
Procumbent.	Trailing.
Puberulous.	Covered with a minute down.
Pubescent.	Covered with fine short hair.
Punctate.	Dotted.
Quadrata.	Square, having sides approximately equal.
Raceme.	An elongated flower cluster.
Racemosely.	In the form of an elongated cluster.
Reduplicate.	Twice folded; once partly so at the centre, like the leaves of a book, and again slightly so near the margins.
Reflexed.	Bent backwards.
Reflexion.	A bending back.
Repand.	Slightly undulating at the margin.
Replicate.	Folded back upon itself, longitudinally folded.
Reticulate.	Having the appearance of a network.
Reticulation.	A network.
Retroflexed.	Bent abruptly backwards; see reflexed.
Revolute.	Rolled back or coiled under.
Rhizome.	A rootstock or perennial underground stem.
Rhomboid.	Four sided, with the opposite sides equal and the angles formed by the sides not right angles. (1) an annulus; (2) any more or less circular area on the surface of the corolla or corona, as a belt of a particular color.
Rotate.	Wheel-shaped, spreading out rather flat in a circle.
Rudimentary.	Imperfectly developed.
Rugose.	Wrinkled, formed of alternate raised and sunken courses.
Rugulose.	Somewhat rugose.
Sepals.	The segments of the calyx.
Seriate.	Arranged in series.
Sessile.	Directly seated on a base, without pedicel or other form of stalk.
Seta.	A bristle.
Setose.	Hairy or bristly.
Sinal.	Pertaining to the sinuses.
Sinuate.	Having an undulating margin.

Sinuous.	Undulating.
Sinus.	A bay, as the recess or depression between two adjoining corolla-lobes.
Spatulate.	Shaped like a flat spoon, roundish with long narrow linear base. Also written <i>Spathulate</i> .
Staminal column.	In the Asclepiadaceae, the columnar body at the centre of the flowers, which incorporates the functions alike of stamens and pistil.
Stellately.	In star-like fashion, radiating from a common centre.
Stigmatic cavities.	In the Asclepiadaceae, cavities in the interior of the top of the style designed to receive the pollen masses.
Stipitate.	Elevated on a stipe or form of peduncle.
Stipule.	An appendage at the base of leaves, rarely used to denote the denticles at the base of the teeth on stems of <i>Stapelia variegata</i> and other Stapeliads.
Striae.	Minute furrows or lines.
Striation.	The condition of being striped, as with minute lines.
Style.	In the Asclepiadaceae, the style, which connects the stigmatic cavities to the ovaries, is located at the centre of the staminal column.
Sub-	Adjectives thus prefixed become qualified in the sense of nearly, slightly, somewhat or partially. Thus <i>subquadrate</i> means almost quadrate.
Subulate.	Awl-shaped; slender and tapering to a point.
Sulcate.	Furrowed, grooved. (<i>Sulci</i> - furrows).
Terete.	Cylindric, or slightly tapering.
Tessellate.	Formed of small checker-like squares.
Trifid.	Cleft into three segments.
Triquetrous.	Three-sided, with the sides flat or concave.
Truncate.	Appearing as if cut off square at the apex.
Tubercle.	A knob-like prominence.
Turbinate.	Shaped like a top, narrow at the base and broad at the apex.
Turgid.	Swollen, bloated.
Umbel.	A flower cluster in which the pedicels all radiate from a common point.
Uncinate.	Hooked at the tip.
Urceolate.	Shaped like an urn, having a swollen tube and a contracted mouth.
Valvate.	Meeting at the edges without overlapping.
Verrucose.	Covered with tubercles or wartlike prominences of the corolla or other tissue.
Vibratile.	Easily swayed back and forth.
Villous.	Covered with soft hairs.
Vinaceous.	Wine-colored, vinous.
Vinous.	Wine-colored.

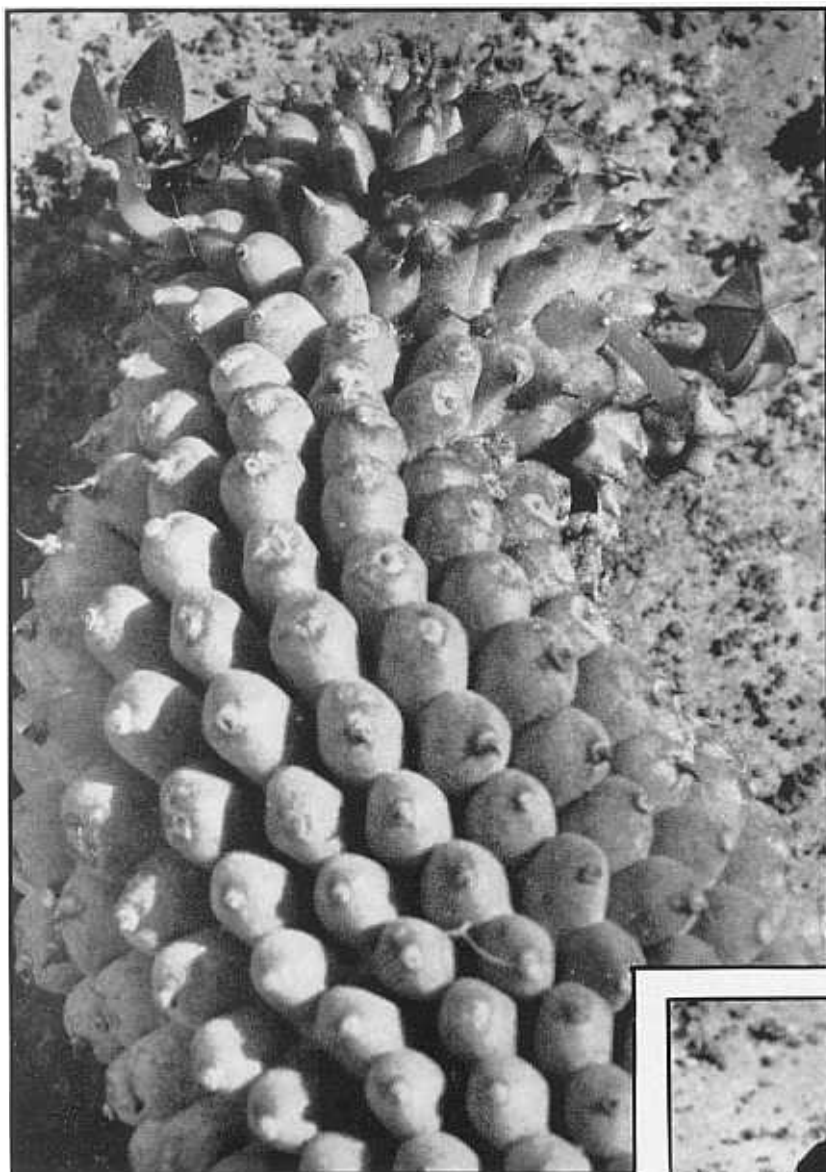


FIG. 1207-C

Trichocaulon pedicellatum Schinz

Photo by Herbert Lang, of a flowering stem from Hope Mine,
near Cape Cross, South West Africa.



APPEND X K

ADDENDA

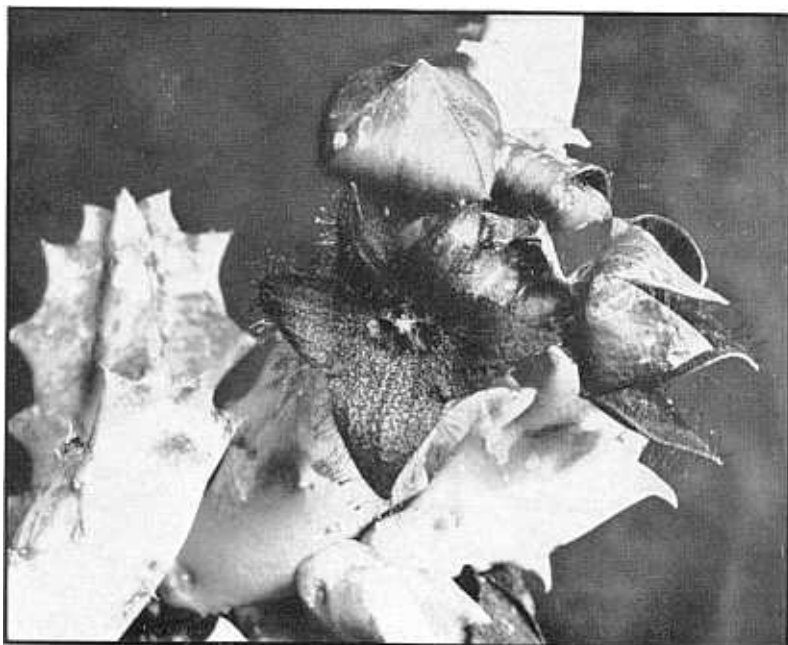


FIG. 1208

Caralluma australis Nel

Photo H. Herre of a plant from Van Wyks Put, Transvaal

A. *Caralluma australis* Nel, sp. nov.

(Description by Dr. G. C. Nel):

Planta suberecta, quadrangularis, glabra; dentes deltoidei. Flores 5-fasciculati, e medio ramorum erumpentes. Sepala ovato-lanceolata, acuminata. Corolla extus glabra, rubro-purpurea, intus leviter verrucosa, tubum versus concentrico-rugata, lutea, rubro-purpureo-maculata, spinis atro-purpureis strictis munita; lobi ovato-triangulati; cilia clavata vel linearia. Coronae exterioris segmenta semi-oblonga, crenulata, 3-dentata, dorso leviter 4-6-sulcata, patentia, vinoso-purpurea. Coronae interioris segmenta antheris incumbencia haud eas excedentia, ad basin excavata, multi-dentata, linearia, apice 3-dentata; pars inferior acutiuscula.

Plant: suberect, caespitose; *stems* stout, 3 to 8 cm. long, 1 to 4 cm. broad, glaucous-green, 4-angled; teeth in the younger stems soft, deltoid, in the older stems short and spiny; at base of each tooth two minute denticles;

Flowers: in clusters of 5 at the middle of the young stems;

Pedicel: 1.4 cm. long, 4 mm. thick, glabrous;

Sepals: 6 mm. long, ovate-lanceolate, acuminate, glabrous;

Corolla: 5.5 cm. in diameter; outside glabrous, vinous purple; inside slightly verrucose, with concentric ridges near the mouth of tube; yellow background with irregular red-purple fields; on upper face large number of black-purple sharp straight spines, easily felt by the hand and visi-

ble without a lens; lobes 2.2 cm. broad at sinus, ovate-triangular, acute, ciliate with vibratile clavate hairs 4 mm. long and some short linear immobile hairs;

Outer corona: lobes quadrate, slightly crenulate, 4 to 6-sulcate, tridentate;

Inner corona: lobes incumbent on the anthers and not or scarcely produced beyond them; base of each lobe excavated, forming two multidentate ridges; the rest of the lobe linear standing on edge platelike, the lower part of the plate ending in a fine sharp point, which alone is somewhat produced beyond the anthers, the upper part of the plate provided with two other shorter teeth, all pointing towards the centre.

Type locality: Transvaal: Pietersburg Distr.: Van Wyks Put.

Distribution: Not further known.

Dr. Nel writes us that this "southern *Caralluma*" was discovered by F. H. Kirsten, and flowered in the University Botanical Garden, Stellenbosch, March, 1936. (Type No. 5881).

(Note: We believe that there may be a slip in the initials as here given for Mr. Kirsten, and that the reference may be to

our collaborator, J. F. Kirsten. We regret that there has not been time to verify this point. The species belongs in the circle of *C. melanantha*, and may be the form of the latter, discovered by Miss A. B. Warren and mentioned at p. 357. It is evidently a very interesting plant, well deserving the honor of specific rank which Dr. Nel has bestowed upon it).

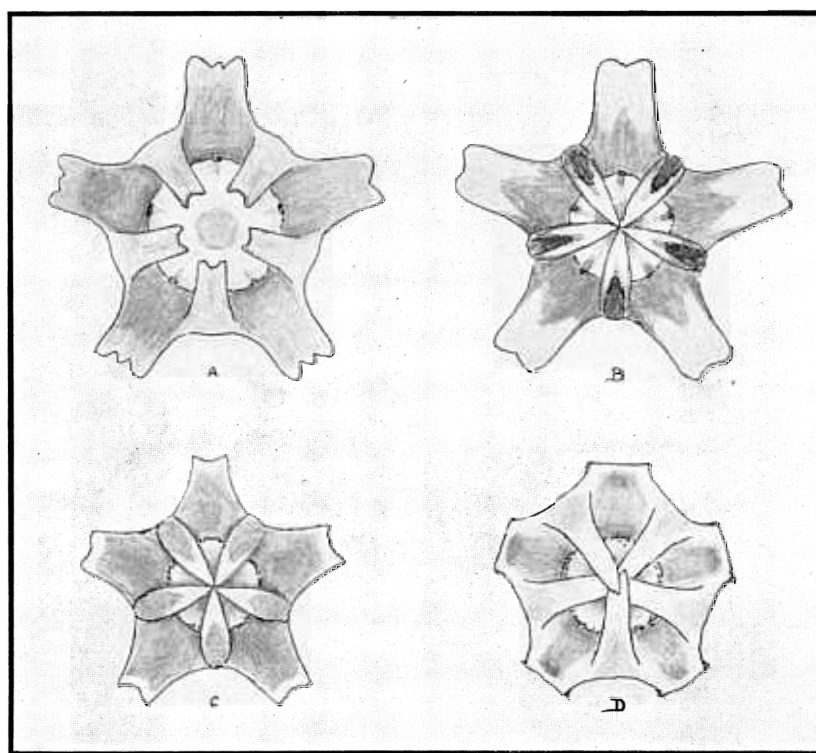


FIG. 1209

Coronas of *Caralluma praegracilis* and the varieties of *C. caudata* x 5

- A. *C. caudata* var. *stvensonii* Obermeijer
- B. *C. caudata* var. *chibensis* Luckhoff
- C. *C. praegracilis* Obermeijer
- D. *C. caudata* var. *milleri* Nel

From a drawing by Dr. R. Broom.

In the last few months *Caralluma caudata* and its relatives have been newly studied by our collaborators, Miss A. A. Obermeijer and Dr. G. C. Nel, and through

their courtesy we are enabled to present two additional varieties of *C. caudata* and a distinct species, *C. praegracilis*.

B. *Caralluma caudata* var. *stevensonii* Obermeijer, var. nov.

(Description by Miss A. A. Obermeijer) :

Caules carnosi, erecti vel ascendentes, basi ramosi, circ. 9 cm. alti, 1.5 cm. diametro, glabri, pallide virides, rubro-maculati, quadrangulares; anguli dentibus ascendentibus, acutis, 21 mm. longis instructi. Flores solitarii vel bini. Pedicelli 1.5—2 cm. longi, 2.75 mm. crassi, erecti. Sepala 9 mm. longa, lanceolata, longe acuminata. Corolla 9 cm. diametro, stellata, extus laevis; tubus parvus, late campanulatus, 12 mm. diametro, 4 mm. longus, pentagonus, purpureo-maculatus; lobi 4.5 cm. longi, basi ovati, longissime acuminati, albidii, purpureo-maculati, margine recurvati, ad basin pilis clavatis instructi. Corona exterior paullo crateriformis; lobi patentes, ascendentes, ad apicem irregulariter dentati. Coronae interioris lobi incumbentes supra antheras dispositi, breves, ad apicem irregulariter dentati.

Stems: erect or ascending, about 9 cm. high, 4-angled, greyish-green spotted with red; teeth 20 to 22 mm. long, curved upwards, rounded;

Flowers: paired or single, situated near the base of the stems, flowering simultaneously or nearly so;

Pedicel: 1.5 to 2 cm. long, 2.75 mm. thick;

Sepals: lanceolate, acuminate, 9 mm. long, projecting between the sinuses of the corolla-lobes;

Corolla: 9 cm. in diameter, stellate; *tube* very shallow and broad, containing the corona, pentagonal, about 4 mm. deep and 12 mm. in diameter, spotted with purple on a whitish-yellow background and with scattered minute dark papillae; *lobes* 4 cm. long, ovate at the base, attenuated and linear above it, with small rounded purple spots on a whitish-yellow background, margin curled backwards and with some vibratile clavate hairs at the base of the lobes;

Outer corona: shallowly cup-shaped; lobes spreading, somewhat ascending, reddish, narrow-oblong, apex white and irregularly toothed usually with two large and several smaller teeth;

Inner corona: lobes incumbent over the anthers, but not meeting at the centre, apex white, irregularly and bluntly toothed.

"Stevenson's variety" was collected near Salisbury, Southern Rhodesia, by Capt. Stevenson. The type is No. 34947 in the Herbarium of the Transvaal Museum. It is closely related to the var. *chibensis*, but may be distinguished by its longer and slenderer corolla-lobes, which have a dull whitish-yellow ground color (instead of bright yellow) and somewhat bigger spots; the inner corona-lobes have no dorsal gibbosity, do not meet in the centre and have

the tips irregularly toothed. The sepals, too, are longer and project beyond the sinuses of the corolla-lobes. The stems are of the same color, but the teeth are longer. The flowers are solitary or 2 together, whereas Miss Obermeijer writes that in the var. *chibensis* she has found the flowers to be more generally in small clusters. We are not certain whether this variety is represented by the larger flower in Fig. 282.



FIG. 1210

Caralluma caudata var. *milleri* Nel

Photo by Herbert Lang.

C. *Caralluma caudata* var. *milleri* Nel, var. nov.

(Description by Dr. G. C. Nel):

Planta carnosa, caespitosa, ramosa; caules 4-angulati, glabri, conico-dentati. Sepala lanceolata, acuta. Corolla extus viridi-lutea, irregulariter purpureo-punctata; petala lineari-lanceolata marginibus recurvatis, acuta, intus saturrime viridi-lutea, purpureo-punctata, sinus versus pilis paucis purpureis clavatis ciliata; tubus brevis, purpureus, minute papillatus. Coronae exterioris segmenta quadrata, retusa, purpurea; coronae interioris segmenta linearia, apiculata, antheris incumbentia.

Stems: 8 cm. high, 5 mm. thick excluding the teeth, each stem giving off 2 to 3 separate branches, glaucous, glabrous, purplish-green, indistinctly 4-angled; angles obtuse with soft conical acute teeth, 1.5 cm. long, of same color as the stems;

Flowers: in fascicles of 4 to 5, in close proximity to the base of the teeth;

*Pedice*l: 1 cm. long, cylindrical, glabrous;

Sepals: lanceolate, acute;

Corolla: in bud conical, tapering to a point; when expanded greenish-yellow outside, with irregular purple spots, becoming less spotted towards the apex; *lobes* 2.1 cm. long, 8 mm. broad at the base, linear-lanceolate, acute, deep greenish-yellow on inner face, with irregular purple spots and some minute papillae, ciliate near the base with a few deep purple clavate hairs; *tube* 5 mm. long, 8 mm. in diameter, purple at the base from the large number of minute purple papillae;

Outer corona: light purplish, lobes quadrate;

Inner corona: lobes light purplish, linear, apiculate, incumbent on the anthers and not produced beyond them, dorsally adnate to the base of the outer corona.

Type locality: South West Africa: Okavango.

Distribution: Not further known.

This variety embraces the handsome-flowered plant from Okavango, South West Africa, shown in Vol. I at Figs. 280 and 281. The type is No. 7390 in the Herbarium of the Stellenbosch Botanic Garden. It was first collected some years ago by A. H. Miller of Grootfontein, South West Africa, and more recently by E. Rusch. It is

characterized by the long-toothed stems and the scattered largish spots on the corolla lobes. The corona form is shown in Fig. 1209, the overlapping of the inner corona lobes being a very distinctive feature, if it proves to be constant. Dr. Nel comments on the peculiarly offensive odor of the flowers.

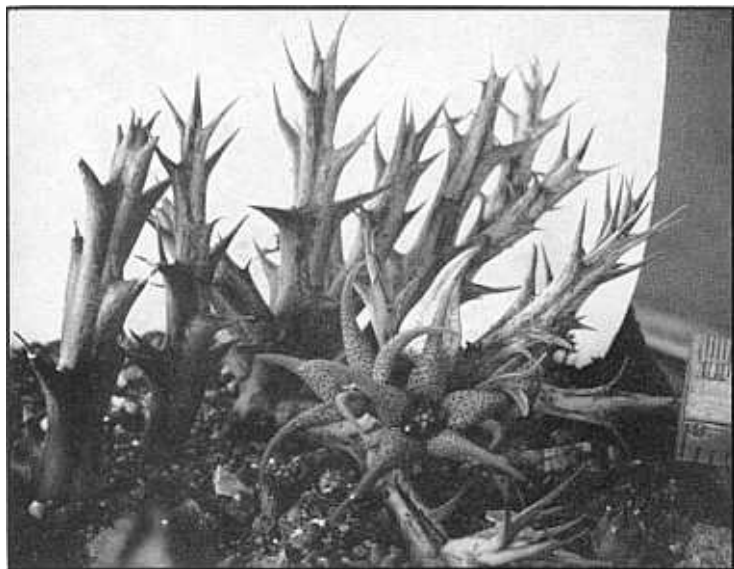


FIG. 1211

Caralluma caudata var. *milleri* N.

Photo by H. Herre.



FIG. 1212

Caralluma praegracilis Obermeijer

Photo by Herbert Lang of the type plant.



FIG. 1213

Caralluma praegracilis Obermeijer x 1

Photo by Herbert Lang.

D. *Caralluma praegracilis* Obermeijer, sp. nov.

(Description by Miss A. A. Obermeijer) :

Caules carnosi, erecti vel ascendentes, basi ramosi, circ. 10 cm. alti, 2 cm. diametro dentibus inclusis, glabri, rubro-maculati, quadrangulares; anguli dentibus ascendentibus, acutis, 9 mm. longis instructi. Flores 3-6-aggregati. Pedicelli 1.5 cm. longi, 3 mm. crassi, erecti. Sepala lanceolata, acuminata, 6 mm. longa. Corolla 6 cm. diametro, stellata, extus albida, purpureo-maculata; discus 12 mm. diametro, verruculosus, purpureus; lobi 2.5 cm. longi, basi 7 mm. lati, longe acuminati, margine recurvati, pilis clavatis instructi, purpureo-maculati. Corona exterior paullo crateriformis; lobi patentes, emarginati. Coronae interioris lobi incumbentes supra antheras dispositi.

Stems: erect or ascending, about 10 cm. high, 4-angled, brownish-green to olive-green, spotted and streaked with red; teeth pointed upwards and outwards, 9 mm. long, rounded;

Flowers: 3 to 6 together, situated about half-way up the stems, flowering simultaneously or nearly so;

Pedicel: about 1.5 cm. long, 3 mm. thick, erect;

Sepals: lanceolate, acuminate, 6 mm. long;

Corolla: flat star-shaped, whitish on the outside spotted with red; *disk* dark indian-red (R.C.S.), velvety, with a few minute bristles near the centre; *lobes* about 2.5 cm. long, ovate at the base and there 7 mm. broad, long acuminate with numerous dark indian-red spots on a light yellow

background, margin recurved and with scattered vibratile hairs;

Corona: raised above the centre of the disk;

Outer corona: shallowly cup-shaped at the base; lobes spreading, vandyke-red (R.C.S.), with the emarginate tips white;

Inner corona: lobes incumbent on the anthers, vandyke-red with the tips white, meeting at the centre.

Type locality: Zululand: Nongoma.

Distribution: Perhaps also in Southern Rhodesia.

The "slender *Caralluma*" is the plant of which a flower has already been figured in Vol. I, at p. 351, as an intermediate form of *C. caudata* (Fig. 286). It was recently collected in Zululand by the Rev. Mr. Gerstner, and the type is Gerstner No. 752 in the National Herbarium, Pretoria. This is the only record where the plant is known to have been found in the wild state, but it has been generally cultivated in Southern Rhodesia for some years and may probably be native there also.

"This plant," writes Capt. R. H. R. Stevenson, "is common in all the succulent gardens in Bulawayo, and comes from Salisbury. It is noticeable at all seasons by the peculiar olive-green stems and the abundance of reddish markings on them, which vary according as it is grown in the shade or open." And Miss Obermeijer adds: "There is, of course, the possibility that the species does not occur wild in Southern Rhodesia. It is an easy grower and may have spread from rockery to rockery. Peculiar of the species, besides the uniformly colored corolla disk, are the thick roots and the short-toothed, hard-green shiny stems, which are very different from those of *C. caudata* and its varieties."

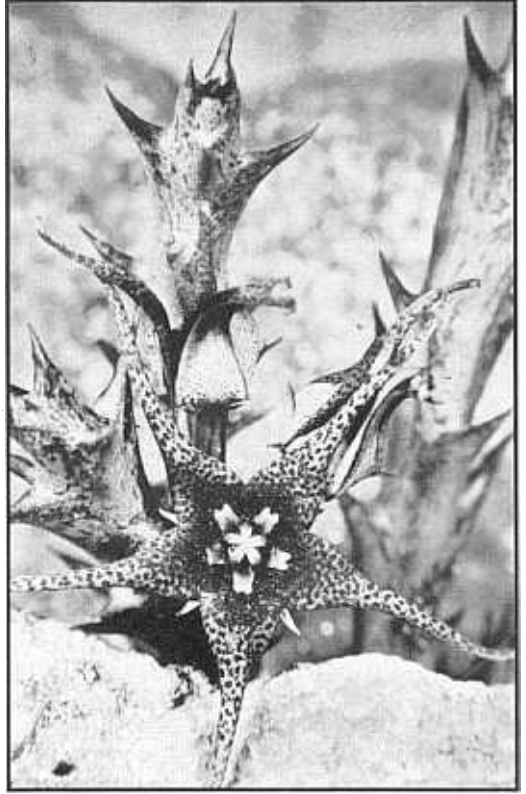


FIG. 1214

Caralluma praegracilis Obermeijer x 1.5
From the collection of A. F. Tissot.

E. *Caralluma tsumebensis* Obermeijer, sp. nov.

(Description by Miss A. A. Obermeijer):

Caules carnosi, ascendentes vel erecti, ramosi, circ. 25 cm. alti, 3.5—8 cm. diametro dentibus inclusis, glabri, pallide virides rubro-maculati, 5-angulares; anguli dentibus patentibus, acutis, triangularibus instructi. Flores multi-aggregati. Pedicelli circ. 1.5 cm. longi. Sepala lanceolata, acuminata, 7 mm. longa. Corolla brunnea, glabra; tubus parvus, campanulatus, 7 mm. longus, 12 mm. diametro; lobi lanceolati, acuti, 2.5 cm. longi, 7 mm. lati. Corona crateriformis; coronae exterioris lobi quadrangulares, dentati; coronae interioris lobi gibbosi et cornuti, apice erecto, recurvato.

Stems: ascending or sometimes erect, branched, about 25 cm. high, 3 to 8 cm. in diameter including the teeth, glabrous, usually 5-angled, pale green spotted with red; teeth triangular, up to 3 cm. long and broad, compressed, with 2 denticles near the apex, upper margin straight or slightly decurved;

Flowers: in sessile umbel-like many-flowered fascicles, towards the base of the stems;

Pedicel: about 1.5 cm. long;

Sepals: lanceolate-acuminate, 7 mm. long;

Corolla: distinctly nerved on the lobes outside; inside deep chocolate-brown, velvety, glabrous, somewhat transversely wrinkled; *tube* small, campanulate, 7 mm. long, 12 mm. in diameter; *lobes* lanceolate, acute, 2.5 cm. long, 7 mm. broad at the base;

Outer corona: cup-shaped; lobes quadrangular, with 2 short teeth at the sides;

Inner corona: lobes with a dorsal hump on the back and produced into a horn about 3 mm. long, above the staminal column, somewhat recurved at the apex.

Type locality: South West Africa: Ovamboland: near Tsumeb.

Distribution: Not further known.

The "Tsumeb *Caralluma*" was described from plants grown in the garden of Dr. E. Nägelsbach in Tsumeb, South West Africa, which flowered in August, 1934. The type specimen is No. 32820 in the Transvaal Museum. Dr. Nägelsbach writes as follows: "I found the plant upon my arrival here a few years ago in the hospital garden and in several other local gardens. I have only once found it growing wild, on red sand near Tsumeb." Tsumeb, the terminus of the light railway line running north from Walvis Bay across Hereroland into Ovamboland, was formerly the centre of the copper mining district in South West Africa.

C. tsumebensis, according to W. Triebner, may be the species mentioned by Prof. Hans Schinz in his manuscript diary of his Ovamboland expedition under the name of *C. stapffii*, a species which he never published, as all his material rotted upon the

return journey to Zurich. If this identification is correct, the first collection of the plant, to judge by the name Schinz proposed, may have been made by his associate, F. M. Stapff, the discoverer of *T. pedicellatum*.

By its fascicles of deep brown flowers, its corona form and an evil odor which has made the flowers a by-word in the gardens of Tsumeb, *C. tsumebensis* appears to be related to the *nebrownii-lutea* chain; but the absence of ciliation on the corolla-lobes brings it closer to *C. huillensis*, from which in turn it is separated by its stems. These are glabrous, not club-shaped, mostly 5-angled and larger than in *C. huillensis*. The flower umbels are usually situated on the lower half of the stems and contain more than 10 flowers. The corolla is a deep chocolate shade of brown, velvety and very pretty.

F. *Caralluma hahnii* Nel, sp. nov.

(Description by Dr. G. C. Nel):

Planta erecta vel suberecta, purpureo-maculata, glauca, 4-angulata; anguli prominentes; dentes patentes, triangulati, molles, acuti. Flores 4-6-fasciculati, e basi ramorum erumpentes. Sepala ovata, acuta. Corolla extus glabra, loborum apicem versus rubro-purpurea, intus granulato-verrucosa, glabra, rubro-purpurea; lobi erecti, lineares, acuti, pilis paucis purpureis clavatis ciliati; tubus brevis, rubro-purpureus, granulato-verrucosus. Coronae exterioris segmenta quadrata, crenulata; pars media lutea, trisulcata; partes exteriores purpureae, glabrae. Coronae interioris segmenta filiformia, tricornuta; cornu inferior suberectum, cornu superior recurvatum, cornu posterior breve sed haud antheris incumbens.

Stems: erect to suberect, 8 to 10 cm. high, 5 to 10 mm. thick, 4-angled; angles fairly prominent; teeth soft, triangular, sharp, 1 cm. long;

Flowers: in fascicles of 4 to 6 towards the base of the stems;

Pedicel: 1 cm. long, 2 mm. broad, cylindrical, glabrous;

Sepals: 6 mm. long, ovate, acute;

Corolla: about 2.3 cm. in diameter, with a central tube about 8 mm. long, and lobes 1.2 cm. long and 6 mm. broad, light red-purple to vinous-purple towards the base and darker red-purple towards the apex; outside glabrous; inside glabrous, granulated-verrucose; lobes erect, linear, acute, ciliate with a few very vibratile clavate purple hairs 2 mm. long;

Outer corona: cup-shaped; lobes quadrate, somewhat crenulate at the apex, yellowish and very slightly trisulcate down the middle, outer lateral margins smooth and purplish;

Inner corona: purplish; lobes consisting of three filiform horns; lower horn suberect; upper horn recurved outwards; rear horn shortly denticulate and very slightly or not at all incumbent on the anthers.

Type locality: South West Africa: Ovamboland: Ondonga, plentiful on sandy soil under *Acacia* shrubs.

Distribution: Not further known.

"Hahn's *Caralluma*" was discovered by Dr. G. C. Nel in Ovamboland, South West Africa, in November, 1935, and first flowered in the University Botanical Garden, Stellenbosch, in April, 1936. (Type

No. 7364). Dr. Nel writes: "I have named this species after Major Hahn, Native Commissioner of Ovamboland, who is a keen collector of succulents in his area." The plant may prove to be related to *C. vaga*.

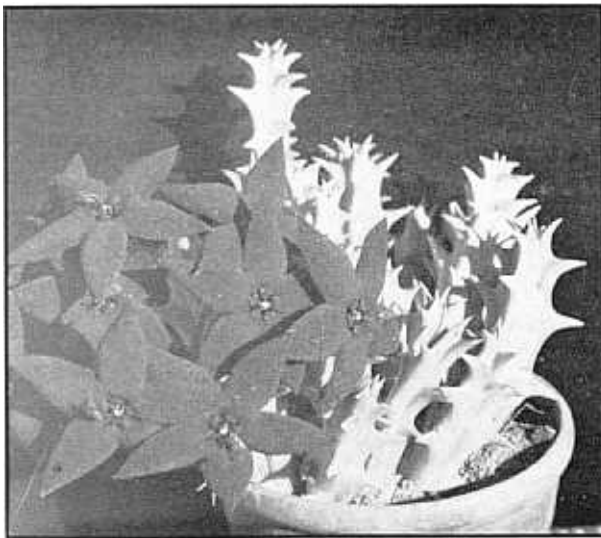


FIG. 1215

Caralluma hahnii Nel

Photo by W. Triebner.



FIG. 1216

Caralluma kalaharica Nel

Photo by W. Triebner.

G. *Caralluma kalaharica* Nel, sp. nov.

(Description by Dr. G. C. Nel):

Planta erecta, glabra, tetragona; costae prominentes, dentibus albidis munitae. Flores 6-11-fasciculati ex apice ramorum. Sepala ovata, acuta. Corolla rotata, lutea vel albida, purpureo-maculata, rugoso-granulata; lobii ovato-lanceolati, acuti, purpureo-clavato-ciliati. Coronae exterioris segmenta quadrata, atro-purpurea, 5-6-striata. Coronae interioris segmenta 3-partita: pars anterior conico-dentata, patens; pars media suberecta, roseo-purpurea, subulato-filiformis, erecta; pars posterior antheris incumbens, roseo-purpurea, subquadrata.

Stems: 2 to 4 cm. long, 1 to 2.5 cm. thick, erect, glabrous, grey-green with large purple blotches, 4-angled; angles obtuse, provided with prominent protuberances, each ending in a sharp whitish tooth;

Flowers: in fascicles of 6 to 11, near the tips of the younger stems;

Bracts: 1 to 2 mm. long, lanceolate;

Pedice: 5 to 8 mm. long, cylindrical;

Sepals: 3 mm. long, ovate, acuminate;

Corolla: rotate, rugose, giving the appearance of being granulated, with semi-rugose wrinkles forming more or less concentric rings around the corona; yellowish-green towards the apex of the lobes, elsewhere white with a fairly large number of irregularly distributed purple dots on the inner face; lobes 1.5 cm. long, 7 mm. broad at the broadest part, ovate-lanceolate, acuminate, ciliate with long clavate purple hairs;

Outer corona: lobes 3 mm. long, 2 mm. broad, quadrate, flat, consisting of a central band of 5 to 6 slightly elevated blackish-purple ribs, with a narrow flesh to rose-colored margin on both sides;

Inner corona: lobes produced beyond the anthers, 3-partite: anterior part conical-toothed; central part slightly thickened at the base but finally ending in a fine point which is half recurved outwards above the anthers; posterior part short, quadrate, incumbent on the anthers but not produced beyond them.

Type locality: Bechuanaland Protectorate: Tsau.

Distribution: Not further known.

The "Kalahari *Caralluma*" was discovered in September, 1935, by Dr. G. C. Nel, a little to the north-west of Lake Ngami in the Bechuanaland Protectorate, growing in sandy soil under bushes. This is over 300 miles from the habitats of *C. knobelii* and its var. *langii*. The plant flowered in the gardens of W. Triebner in Windhoek, South West Africa, in November, 1935 (No. 2105). It appears to be intermediate between *C. knobelii* and the var. *langii*. Dr. Nel points out that it differs from the var. *langii* in the much shorter pedicels of the flowers, barely 4 lines long, and in the uniform distribution of the markings, which never leave an open whitish band of the background down the middle of the corolla face, in the manner characteristic of some flowers of the var. *langii*.

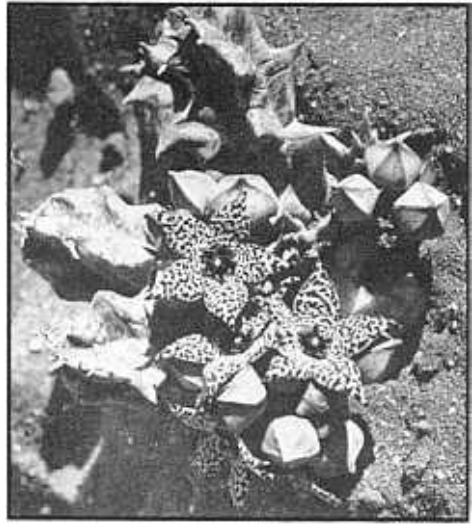


FIG. 1217

Caralluma kalaharica Nel

Photo by H. Herre.

H. *Stapelia discoidea* Obermeijer, sp. nov.

(Description by Miss A. A. Obermeijer):

Caulis erecti, acuti 4-angulati, dentibus adscendentibus attenuatis. Flores solitarii ad basin ramorum inserti. Pedicelli 2.5 cm. longi, crassi. Sepala ovata, 6 mm. longa, 3 mm. lata, glabra. Corolla rotata, 4.5 cm. diametro; discus 10 mm. diametro, annulo crasso brunneo; lobi late ovati, 17 mm. longi, 10 mm. lati, lutei, brunneo-maculati, marginibus pilis vibratilis clavatis ciliatis. Corona exterior super discum adpressa, 5-lobata, lobis obtusis gibbosis; corona interior 5-lobata, lobis spathulatis supra antheras incumbentibus.

Stems: only a small cutting seen, which resembled the stems of *Stultitia cooperi*; glabrous, usually 4-angled, teeth large, 1 cm. long, ascending, conical, tapering, acute, greyish-green, usually mottled with red;

Flowers: solitary, developing from the base of the stems;

Pedicel: 2.5 cm. long, 3 mm. thick;

Corolla: rotate, 4.5 cm. in diameter; centre dark brown, with the disk raised, 10 mm. in diameter, minutely puberulous (as seen when magnified); lobes broadly ovate, 17 mm. long, 10 mm. broad, obscurely transversely wrinkled, yellow with irregular coarse dark brown spots (the spots large and connected at the base, becoming smaller and rounded towards the apex), ciliate with vibratile clavate dark hairs;

Outer corona: appressed to the corolla-disk, dark brown; lobes rounded, obtuse, with a raised tongue-like gibbosity at the tips;

Inner corona: lobes simple, spatulate, yellowish with a few spots, incumbent on the backs of the anthers, tips obtuse not meeting at the centre, connate at the base to the outer corona.

Type locality: ? Southern Rhodesia: without precise locality.

Distribution: Not further known.



FIG. 1217-A

Stapelia discoidea Obermeijer

Photo by Herbert Lang.

The "discoïd *Stapelia*" is the latest member of the *Stapelluma* section of the *Stapelias*. It was received by Miss Obermeijer from Capt. R. H. R. Stevenson in Southern Rhodesia, without particulars as to its origin, and the type specimen is No. 35740 in the Herbarium of the Transvaal Museum.

Miss Obermeijer writes of the flowers: "They belong in the group with *Stapelia woodii*, *S. semota*, *S. longidens*, *Stultitia cooperi* and *S. tapscottii*, all of which have the corolla more or less rugose, with an annulus on the disk, the lobes ciliate with vibratile clavate hairs, and a simple corona structure. In particular they are related to *Stapelia woodii*, but are distinguished from that species by the corolla-lobes being yellow, spotted with brown, by the minute pubescence of the disk, and by the pale color of the inner corona-lobes."

The last two characters also appear to separate *S. discoidea* from *S. semota*, to which species the similar coloring of the corolla-lobes closely allies it.

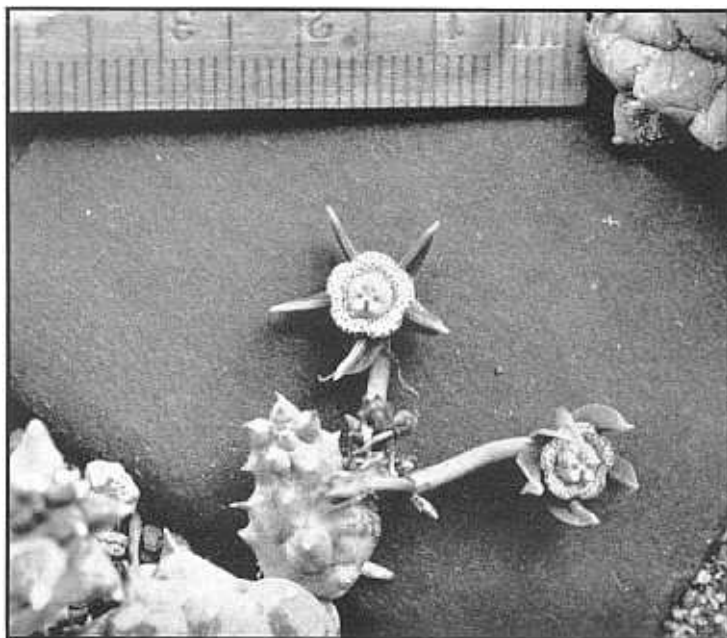


FIG. 1218

Duvalia minuta Nel

Photo by G. C. Nel.

I. *Duvalia minuta* Nel, sp. nov.

(Description by Dr. G. C. Nel) :

Planta minuta; caules subglobosi vel subcylindrici, glabri, virides, prominenter tuberculati; spini triangulati. Flores e basi vel ex apice caulium erumpentes, 2-4-fasciculati. Pedicellus cylindricus, glaber. Sepala ovata, acuta, glabra. Petala replicata, extus glabra, intus glabra, lutea, inaequaliter purpureo-maculata, linearia, mucronata, albo-hispido-ciliata; annulus albus, atro-purpureo-maculatus, pilis multis brevibus hispidis instructus. Corona lutea.

Plant: small, clustered; *stems* subglobose to subcylindrical, 1 to 1.8 cm. long, 1 to 1.2 cm. thick, green, 5-angled; angles with prominent tubercles, each ending in a sharp triangulate tooth;

Flowers: in fascicles of 2 to 4, either at the base or apex of the stems;

Pedicel: 1.3 cm. long, glabrous, cylindrical;

Sepals: 1 to 1.5 mm. long, ovate, acute, glabrous;

Corolla: 1.5 cm. in diameter; *lobes* 5 mm. long, linear, replicate, tips upright, mucronate, glabrous outside and in, yellowish-green spotted irregularly with very light purple spots, ciliate with very short minute stiff white hairs; *annulus* 5 mm. in diameter, raised at the outer edge into a distinct rim and divided into 5 distinct segments, white with irregular deep purple spots, with numerous short stiff white hairs;

Outer corona: yellow;

Inner corona: yellow.

Type locality: South West Africa: Great Namaqualand: Mickberg-Karasberge.

Distribution: Not further recorded.

This is the plant, whose flower was shown in Fig. 766, page 766, and there referred to the type of *D. maculata*. It was collected by Ernst Rusch, and flowered in the University of Stellenbosch Botanic Garden, March, 1936. Dr. Nel writes that the flowers, while very near to *D. maculata*, differ from that species in the coloration.

The great distance between the habitats of the two plants suggests a specific difference between them, but E. R. Fuller reports that *D. maculata* is found in the Prieska district also. The plant, with its charming little flowers, is a most interesting one, and we hope to learn more of its exact relationships.

J. *Huernia striata* Obermeijer, sp. nov.

(Description by Miss A. A. Obermeijer) :

Caules erecti, 5-8 cm. alti, 1-1.5 cm. lati, glabri, virides, obtuse 4 (rarius 5-6) angulati, dentibus compressis deltoideis, 2-4 mm. longis apiculatis. Flores 3-5-aggregati. Pedicelli 1.5-2.5 cm. longi. Sepala 2.5 mm. longa, lanceolata, acuta. Corolla 1.4-1.7 cm. diametro; tubus 6 mm. altus, 4-6 mm. diametro, plus minusve bulbosus (i.e. ad faucem constrictus), extus pallide viridis, intus sordide pallide luteus, regulariter transversaliter nigro-striatus; limbus ex ore tubi patens, sordide pallide luteus, nigro-striatus, ad marginem loborum parve papillulatus; lobi circa 5 mm. longi, deltoidei, acuti, apice recurvati. Corona exterior 4 mm. diametro, ad basin tubi adpressa, nigra, minute verruculosa, 5-lobata; lobi lineari, emarginati vel bifidi. Coronae interioris lobi erecti, 2.5 mm. longi, geniculati, supra antheras conniventi, acuti, nigri.

Stems: erect, 5 to 8 cm. high, 1 to 1.5 cm. thick, glabrous, green, obtusely 4 (seldom 5 or 6) -angled, with short compressed triangular apiculate teeth, 2 to 4 mm. long;

Flowers: 3 to 5, aggregated on short swollen side shoots halfway or near the base of the stems, developing successively;

Pedice: 1.5 to 2.5 cm. long, stout;

Sepals: 2.5 mm. long, lanceolate, acute;

Corolla: tube 6 mm. long, 4 to 6 mm. in diameter at the mouth, somewhat swollen in the middle and constricted at the mouth, outside pale greenish sometimes suffused with wine red, inside pale dirty yellow and transversely striped with thin dark lines, with a small dark centre at the base of the tube; limb spreading, 1.4 to 1.7 cm. in diameter, pale dirty yellow with thin concentric dark stripes, with a few minute papillae near the margin of the lobes (as seen when magnified); lobes about 5 mm. long, deltoid, acute, somewhat recurved at the apex;

Outer corona: 4 mm. in diameter, appressed to the corolla-tube, black, minutely warted (as seen when magnified), with 5 linear emarginate or shortly bifid lobes;

Inner corona: lobes erect, 2.5 mm. long, acute, black, geniculate near the base, meeting above the anthers.

Type locality: South West Africa: Great Namaqualand: Tiras Mountains.

Distribution: Not otherwise known.

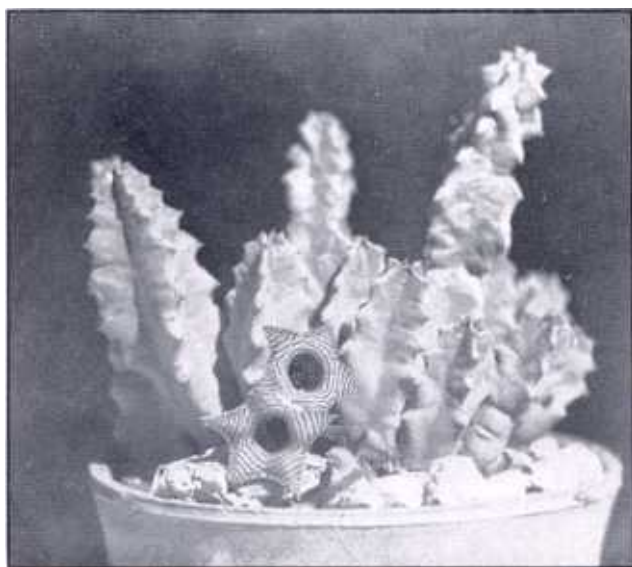


FIG. 1219

Huernia striata Obermeijer

Photo by W. Triebner.

The "striped *Huernia*" is one of the many interesting recent discoveries of the South West African collector, W. Triebner. The type is No. 35738 in the Herbarium of the Transvaal Museum. It is a very attractive species, of which Miss Obermeijer writes: "The flowers approach those of *H.*

namaquensis, but they differ by the absence of papillae on the limb and at the mouth of the tube, by the regular stripes on the limb and in the tube, and by the somewhat different corona. The size of the corolla, too, is slightly smaller, and the pedicel is longer."

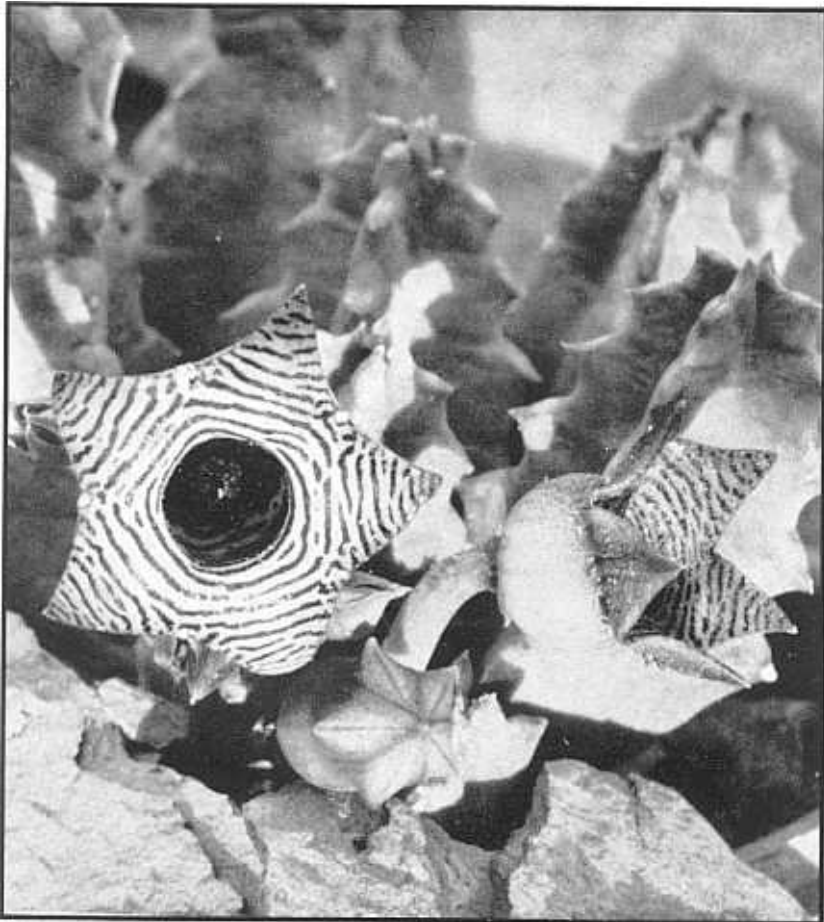


FIG. 1220

Huernia striata Obermeijer

Photo by Herbert Lang.

K. *Huernia whitesloaneana* Nel, Cactus and Succulent Journal Am., viii. 9. 1936.

(Description by Dr. G. C. Nel):

Plant: caespitose; stems 5 cm. high, glabrous, greenish, purplish at tip, 4 to 5-angled; angles very prominent, slightly twisted or contorted; each tubercle provided with a deltoid tooth;

Flowers: 4 to 5, in fascicles near the base of the stems;

Pedicel: 8 mm. long, glabrous, terete;

Sepals: 5 mm. long, lanceolate, ovate-acuminate;

Corolla: in bud oblong-globose; when expanded campanulate, 1.2 cm. in diameter, 1.4 cm. long; outside mottled irregularly purple, prominently 3-ribbed, the middle rib being most prominent; *tube* 1 cm. long, light blood-red in color at the base around the corona, then about the middle ringed with about 5 concentric reddish-purple lines, the rest of the tube above covered with conical soft purplish or spotted mucronate papillae; *lobes* 4 mm. long, acute, mottled purplish and covered with purplish papillae;

Outer corona: dark purple; lobes quadrate, emarginate;

Inner corona: light purplish, lobes incumbent on the anthers but produced beyond them, recurved outwards, linear, obtuse.

Type locality: Transvaal: Zoutpansberg Distr.: Forest Station, 4,500 feet elevation.

Distribution: Not further known.

In naming this species, Dr. Nel has conferred on us a compliment which is deeply appreciated. He discovered the plant in June, 1935, growing in sandy soil in association with a *Euphorbia* in the grounds of

the Forest Station on the Zoutpansberg. It flowered in March, 1936, in the University Botanical Garden, Stellenbosch (Type No. 5720).

Dr. Nel states that the species is closely allied to *H. loeseneriana* and *H. nouhuysii*, differing from the former in the smaller flowers, purple coloration and concentric lines in the tube, as well as in the character of the inner corona-lobes, and from the latter in the much shorter pedicels and different colored corona.



FIG. 1221

Huernia whitesloaneana Nel

Photo by H. Herre of a plant from Zoutpansberg, Transvaal.



PLATE XXXVIII.

Huernia whitesloaneana Nel

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1936.

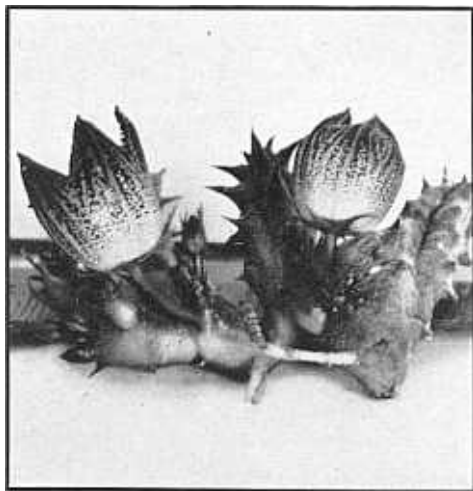


FIG. 1222
Huernia whitesloaneana Nel
Photo by H. Herre.

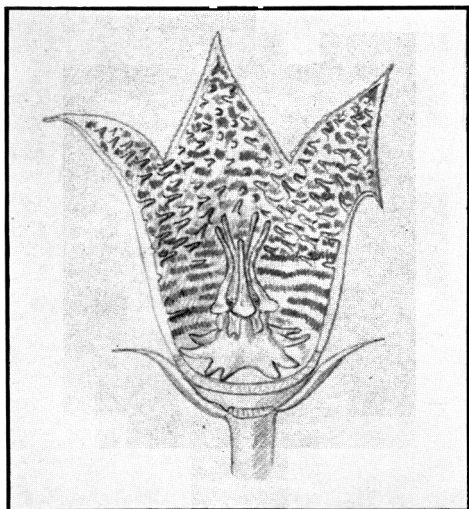


FIG. 1222-A

Huernia whitesloaneana Nel

Cross-section of the corolla, showing the corona, from an enlargement by Miss Cythna Letty for the Flowering Plants of South Africa, 1936.

L. *Huerniopsis gibbosa* Nel, sp. nov.

(Description by Dr. G. C. Nel) :

Planta procumbens vel suberecta, prominenter tetragona, grisea vel griseo-viridis; anguli spinis deltoideis, ad basin bidentatis, muniti. Gemma globosa, glabra, purpureo-grisea. Flores 2-4-fasciculati, apice inserti. Sepala ovata, acuminata, glabra. Petala ovata, acuta, intus glabra, minute granulata et verruculosa, apicem versus luteo-viridia, ad basin rufo-purpurea; faux tubi minute papillata; tubus brevis, campanulatus, luteus, minute granulatus, glaber. Corona luteo-alba; segmenta antheras excedentia, basi subrotunda, bidentata; apices patentes, falcati, recurvati, plano-compressi, acuti.

Plant: caespitose; *stems* decumbent or suberect, 5 cm. long, 1 cm. broad, 4-angled; angles very prominent, 5 mm. long, tipped with very sharp deltoid white teeth 3 mm. long, bearing at the base two small denticles pointing towards the stem;

Pedicel: 5 mm. long, glabrous;

Sepals: 9 mm. long, ovate, acuminate;

Corolla: in bud globose, with the angles very prominent, greyish mottled with purplish, tapering to a point, 1.8 cm. long, 1.4 cm. in diameter, glabrous; when expanded *lobes* 1.8 to 2.5 cm. long, 9 mm. broad, ovate, acute, greenish-yellow on the upper 7 mm., dark purple below, verruculose and finely granulated, minutely papillate at the base around the mouth of the tube; *tube* very short, minutely granulated, glabrous, 3 to 4 mm. long, lighter colored than the lobes;

Corona: 1 to 1.3 cm. long; lobes cream-colored on the lower part, which is subrotund and bidentate, yellowish-white on the upper part, which is acute, plano-compressed with outward bent falcate tips exceeding the anthers by about 5 mm.

Type locality: Cape Province: British Bechuanaland: Lobatsi.

Distribution: Not further known.

Collected by Dr. G. C. Nel in Sept., 1935, 7358 in the Herbarium of the Stellenbosch growing under bushes. The type is No. Botanical Garden.



FIG. 1223

Huerniopsis gibbosa Nel

Photo by G. C. Nel.

M. *Trichocaulon sociarum*, sp. nov.

(Description by A. White and B. L. Sloane):

Trichocaulon sociarum, species insignis sectionis *Cactoideae*, caulibus 10 cm. altis, 4-6 cm. crassis, floribus 1 cm. diametro versus apicem caulium dispositis. Inter omnes species generis radiis helvinis in medio loborum badiorum corollae distinctissima.

Stems: up to 10 cm. high, 4 to 6 cm. thick, formed of many irregular rows of spineless tubercles;

Flowers: scattered near the apex of the stems;

Corolla: 1 cm. in diameter; *tube* 4 mm. in diameter and about equally deep, striped and spotted in light yellow and reddish-brown; *lobes* reddish-brown, with a light yellow ray up the middle and shorter bands of a darker yellow at the sinuses;

Outer corona: lobes slender, bifid, apparently dark reddish-brown;

Inner corona: lobes slender, incumbent over the anthers, light yellow with reddish-brown margins.

Type locality: South West Africa: Namib desert: on the Brandberg, 120 miles north of Swakopmund.

Distribution: Not further known.

This spineless-stemmed *Trichocaulon*, the "Trichocaulon of our comrades," is noteworthy for the great delicacy of the markings in the corolla-tube of the 2/5-inch flowers and for the striking light yellow rays down the middle of the reddish-brown lobes. It was discovered by W. Triebner, and the type is No. 1717-A in his

collection. We dedicate the species to our most loyal comrades in the *Stapelia* cause, Miss Margaret White, of Litchfield, Connecticut, and Mrs. Boyd L. Sloane, of Pasadena, California, who have inspired our book and so patiently helped us to these concluding pages.

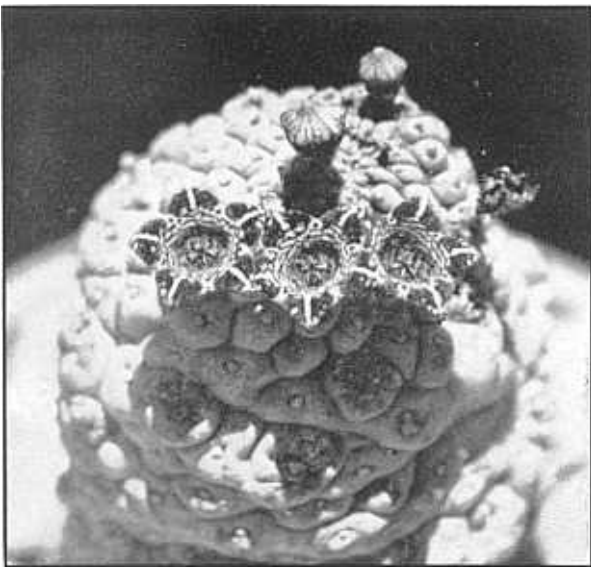


FIG. 1224

Trichocaulon sociarum, sp. nov.

Photo by W. Triebner.

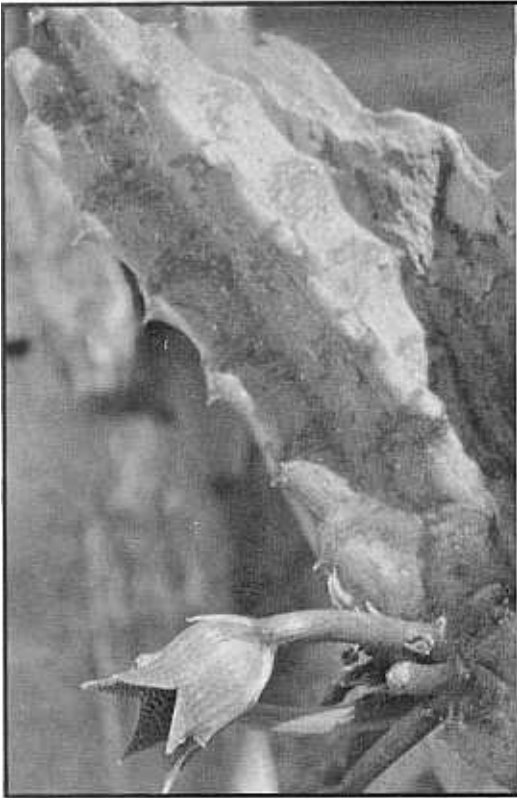


FIG. 1225

Huernia inornata Obermeijer
Photo by Herbert Lang.



FIG. 1226

Huernia inornata Obermeijer
Photo by Herbert Lang.

N. *Huernia inornata* Obermeijer, sp. nov.

(Description by Miss A. A. Obermeijer) :

Caules erecti, circa 8 cm. alti, 12 mm. lati, glabri, virides, obtuse 4-angulati, dentibus parvis recurvatis. Flores 4-6-aggregati. Pedicelli 1.5 cm. longi. Sepala 5 mm. longa, lanceolata, acuta. Corolla 12 mm. longa, 8 mm. diametro, glabra, intus maculata et striata; tubus 8 mm. longus, 7 mm. diametro, cylindricus; lobi erecti, triangulari, acuti, 5mm. longi, ad basin 5 mm. lati. Corona exterior 3 mm. diametro, ad basin tubi adpressa, nigra, minute velutina; lobi profunde bifidi. Coronae interioris lobi erecti, geniculati, supra antheras conniventi, apice acuminati, recurvati.

Stems: erect, about 8 cm. high, 12 mm. thick, glabrous, mottled, obtusely 4-angled, with small somewhat compressed recurved teeth;

Flowers: 4 to 6, aggregated on short swollen side shoots near the base of the stems, the buds developing successively;

Pedicel: 1.5 cm. long, stout;

Sepals: 5 mm. long, lanceolate, acute;

Corolla: 12 mm. long, 8 mm. in diameter, cylindrical, glabrous, outside red, minutely spotted in dark red, inside dark buff spotted and striped with wine-red; *tube* cylindrical, 8 mm. long, 7 mm. in diameter at the throat, inside reddish at the base, then banded on the lower half with

a few coarse irregular red stripes, and near the mouth with many narrower transverse red lines; lobes erect or somewhat spreading, triangular, 5 mm. long and 5 mm. broad at the base, spotted, with the apex acute;

Outer corona: 3 mm. in diameter, appressed to the base of the tube, black, minutely velvety; lobes divided nearly to the base into two finger-like segments;

Inner corona: lobes 3 mm. long, erect, geniculate near the base, converging above the anthers and then diverging, apex acuminate, glabrous.

Type locality: Cape Prov.: Albany Distr.: Howiesonspoort.

Distribution: Not further known.

The "*unadorned Huernia*" was recently discovered by A. Wood of Grahamstown, at Howiesonspoort near that city, and was described by Miss Obermeijer from a living plant received from W. Triebner, which flowered in June, 1936.

The flowers approach those of the neighboring *H. thureti* in the details of the corolla markings, and in their wholly glabrous character, as well as in their corona form, but they differ very much in size and shape. Indeed, in shape, the flowers more nearly

resemble those of *H. levyi*, for the tube is long and cylindrical, and not at all globose-campanulate, and the limb is erect or nearly so, and does not flare out at all at right angles from the tube. In size, the flowers are smaller even than those of *H. thureti*. Their general appearance has been compared to that of "an undeveloped *H. thureti*", but as their shape is constant, according to Mr. Triebner, it can hardly be dismissed as constituting only a structural freak of Cels' species.

O. *Caralluma codonoides* K. Schumann, see p. 245.

(Description by Miss A. A. Obermeijer, contributed):

Plant: robust, up to 1 meter high and as much in diameter; *stems* glabrous, branched, 4-angled, squarish and 3 cm. or more in cross-section; angles irregularly toothed, thickened with brownish corky ridges; apex attenuate, club-shaped, bearing the scars of old pedicels;

Inflorescence: capitate, 15 cm. in diameter, compact, about 40-flowered;

Bracts: small, filiform, 3 mm. long;

Pedicel: 1 cm. long, 3 mm. thick;

Sepals: linear-subulate, 6 mm. long, with a few minute scattered hairs;

Corolla: in bud pear-shaped; when expanded campanulate, with a broad tube and erect or somewhat spreading lobes; *tube* 1.5 cm. long and as broad at the mouth, dark purple outside, inside shiny yellowish-green; *lobes* triangular, 1.2 cm. long, 9 mm. broad at the base, smooth and dark purple outside, papillate inside, purple, margins somewhat recurved, ciliate with vibratile purple hairs;

Outer corona: spreading, appressed to the base of the corolla-tube, whitish; lobes 3 mm. long, divided to the base into two subulate segments, the segments adhering close together;

Inner corona: lobes short and blunt, or emarginate, incumbent over the staminal column and just touching one another at the centre, with a slight dorsal hump near their insertion between the broad sinuses of the outer corona-lobes.

Important new light on the relationship of *C. codonoides* to *C. speciosa* is furnished by the foregoing description contributed by Miss Obermeijer, based on material collected by Baron N. P. von Wolff in July, 1936, at the foot of the Usambara mountains in Tanganyika, 110 miles north-west of Momba or about 200 miles from Amani (Transvaal Museum Herbarium, No. 35831). The species was extremely common in that locality, in full flower, with an exceptionally pungent and almost overpowering odor.

Even with so complete a description it remains difficult to be certain whether *C. codonoides* is identical with *C. speciosa*,

partly because the coloring of the flowers in the latter is not stated. There also may be a distinction in the character of the inner corolla surface, which is now shown to be papillate in *C. codonoides*, whereas regarding the corolla surface of *C. speciosa* nothing is said except that it is entirely glabrous apart from the ciliation of the lobes. In many particulars the descriptions of the two plants tally closely and, if *C. codonoides* does not eventually prove to be identical with *C. speciosa*, we believe it will at least be regarded as a variety thereof. The type habitats of the plants are about 750 miles apart.

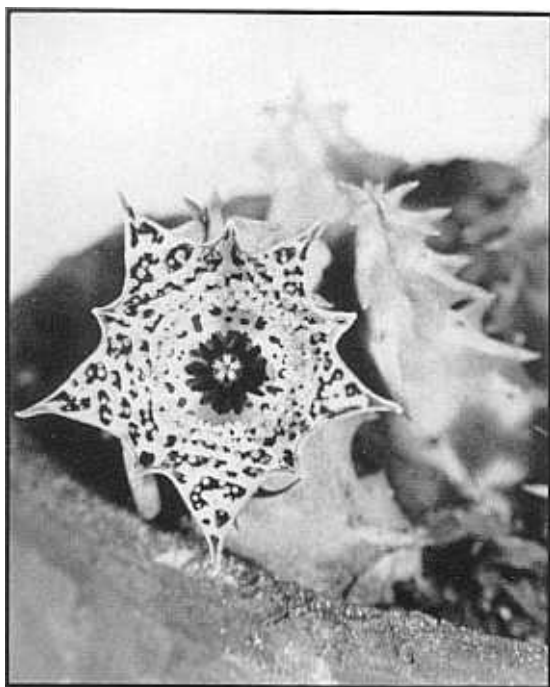


FIG. 1227

Huernia herrei, sp. nov.

P. *Huernia herrei*, sp. nov.

(Description by A. White and B. L. Sloane):

Species nostra, caulibus ad 5 cm. altis, corolla maculata ad 2.5 cm. diametro, *Huerniam brevirostrem* in mentem vocat, a qua dentibus caulium decurvatis et corollae tubo maculato neque ad basin solide purpureo late discedit. Corolla intus a fauce tubi usque ad apices lorum papillata, papillis albescentibus maculas purpureas lorum transabientibus. Lobi corollae exterioris valde bifidi; lobi corollae interioris lineati, obtusi, papillati, supra antheras incumbentes et eas breviter excedentes, sed non conniventes.

Stems: erect, 3 to 5 cm. high, 1 to 1.5 cm. thick, glabrous, grey-green, uniformly 5-angled; angles obtuse, with a purplish axil just above each tooth; teeth compressed, decurved;

Flowers: in cymes of 2 to 4, from the middle of the stems, opening successively;

Pedicel: 1 cm. long, glabrous;

Sepals: 5 mm. long, lanceolate-acuminate, glabrous;

Corolla: 2.2 to 2.5 cm. in diameter; *tube* 8 mm. deep, 10 mm. wide, whitish-yellow on the inner face with more or less regularly outlined purple spots; limb spreading from the mouth of the tube, with pronounced intermediate points at the sinuses between the lobes; *lobes* 7 mm. long, deltoid-acute, whitish-yellow marked with irregular blotches of purple, heavily papillate from the mouth of the tube to the apex of the lobes, but with the papillae becoming smaller toward the apex of the lobes;

Outer corona: 5 mm. in diameter, velvety purple; lobes deeply bifid;

Inner corona: lobes linear, obtuse, incumbent over the anthers and then shortly erect but not connivent, papillate at apex, lower half purplish-white striped with deeper purple, upper half white with a purple spot at the tip.

Type locality: Cape Prov.: Little Namaqualand: Richtersveld Lekkersing

Distribution: Not further known.

Since p. 823 of this book has been in the printer's hands, we have had the pleasant surprise of having an unnamed plant, received from the University of Stellenbosch Botanic Gardens, flower and prove to be the same plant shown in Fig. 836 under the provisional name, *Huernia herrei*. The type of this very handsome species, therefore, is No. 389-1 in the White and Sloane collection.

H. herrei is a very distinctive species, as the stems are recognizable by their downward-pointing teeth, even when the plant is not in flower. The flowers are charming, the spots on the inner corolla surface being

of a fine purple tone against the delicate whitish-yellow ground color. In the corolla tube the spots are clearly outlined; on the lobes they are irregular in form and they are often perforated by two or three of the papillae, thereby getting a freckled appearance, quite unlike that of any other *Huernia*. This effect can readily be seen in the photographs (Figs. 836 and 1227) by examining closely the markings nearest the apex of the corolla lobes.

H. herrei was discovered by our collaborator, Hans Herre, and we dedicate it to him in acknowledgment of all he has done for the cause of the STAPELIEAE.

Var. a. *Huernia herrei* var. *immaculata*, var. nov.

(Description by A. White and B. Sloane)

A typo recedit corolla intus albo-lutea, tota immaculata.

Corolla: wholly whitish-yellow, without markings;

Otherwise as in the type.

Type locality: Cape Prov.: Little Namaqualand: Richtersveld: between Steinkopf and Karrachab.

Distribution: Not further known.

This new variety, which we describe from the photograph by Mr. Herre reproduced as Fig. 1228, makes the third in a delightful series of uniformly light-colored *Huernias*, its companions being *H. primulina* and *H. brevirostris* var. *immaculata*.

In *H. primulina*, the best known of these three graces, the inner corona-lobes are not produced above the anthers; the inner face of the corolla is wholly smooth, or (in its var. *rugosa*) covered with small tubercles, and without hairs. In *H. brevirostris* var. *immaculata*, the inner corona-lobes are produced above the anthers; and the inner face of the corolla is papillate, the papillae in the throat of the tube and around its mouth tipped with short, pinkish hairs. In *H. herrei* var. *immaculata*, the inner corona-lobes are again produced above the anthers; and

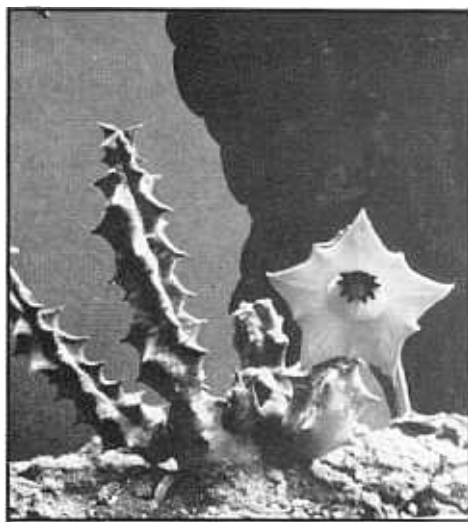


FIG. 1228

Huernia herrei var. *immaculata*, var. nov.
Photo by H. Herre of a plant from Karrachab,
Richtersveld, Little Namaqualand.

the inner face of the corolla is papillate, but the papillae are not hair-tipped. The plant stems share the character of the type, of having their teeth somewhat decurved.



PLATE XXXIX.

Caralluma gerstneri Letty

From the original water color drawing by Miss Cythna Letty
for the Flowering Plants of South Africa, 1936.

Q. *Caralluma gerstneri* Letty, Flow. Pl. So. Afr., t. 631. 1936.

(Description by Miss Cythna Letty, l.c.):

Plants: growing in dense clumps, spreading by stout underground runners; *stems* bluish-green, mottled in patches with dull purple spots, 6 to 7 cm. high; 2.5 to 3 cm. thick including the teeth, rather deeply 4-angled, glabrous; teeth conical spreading, up to 1.3 cm. long, with two minute teeth on each side towards the apex;

Flowers: in fascicles of 2 to 6, arising in the angles of the stems and opening in succession, sometimes 2 or 3 being open at the same time; *peduncle* stout, 2 mm. long, glabrous;

Pedicel: 1 cm. long, 2 mm. thick, glabrous;

Sepals: green, shading to brown at the tips, 8 mm. long, 1.5 mm. wide, lanceolate, with subulate acuminate tips, glabrous;

Corolla: in bud conical, obtuse, with 5 small teeth at the sinuses of the lobes; when expanded 3.5 cm. in diameter; *tube* cup-shaped, pentagonal, pale cobalt-green without, dark purple-red velvety densely and minutely papillate within, with the papillae erect larger and white under the outer corona-lobes; *lobes* spreading cobalt-green without, parchment-colored above but color almost obliterated by dark purple-red spots and blotches, rugose velvety, with the rugosities having a crystalline frosted appearance, 1.5 cm. long, 8 mm. broad at the base, ciliate on the margins from just above the sinuses for 5 mm. of the length; cilia purple, vibratile, 1.5 mm. long, clavate, occasionally bristle-tipped;

Corona: basin-shaped, 4 mm. high from base to tips of inner corona-lobes, 9 mm. in diameter;

Outer corona: lobes 2 mm. long, 2 mm. wide, 2-keeled on the face, 3-toothed, with the middle tooth light yellow, oblong-ovate, subacute; lateral teeth reddish-brown, narrower, attached to the inner corona-lobes;

Inner corona: lobes 2-horned, semi-cylindric, lanceolate, incumbent on the anthers and produced beyond them, slightly thickened touching and then diverging at the tips, with the dorsal horn subulate and joined for two-thirds the length of the lobe and then spreading and rugose crested at the base.

Type locality: Zululand: Magut.

Distribution: Not further known.

This interesting new *Caralluma*, with livid reddish flowers, was discovered by the Rev. F. J. Gerstner of the Benedictine Mission at Nongoma, Zululand. It was found by him about 100 yards from the Mission Station, towards Pongola Bridge.

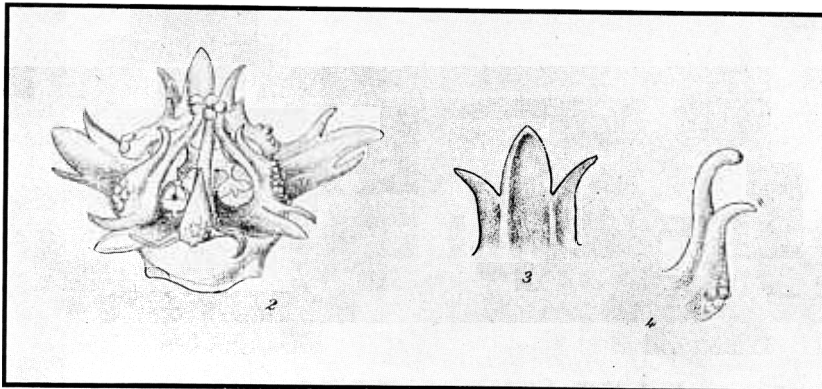


FIG. 1229. *Caralluma gerstneri* Letty

Enlargement of the corona, showing also an outer corona-lobe, and an inner corona-lobe from a drawing by Miss Cythna Letty for the Flowering Plants of South Africa, 1936.

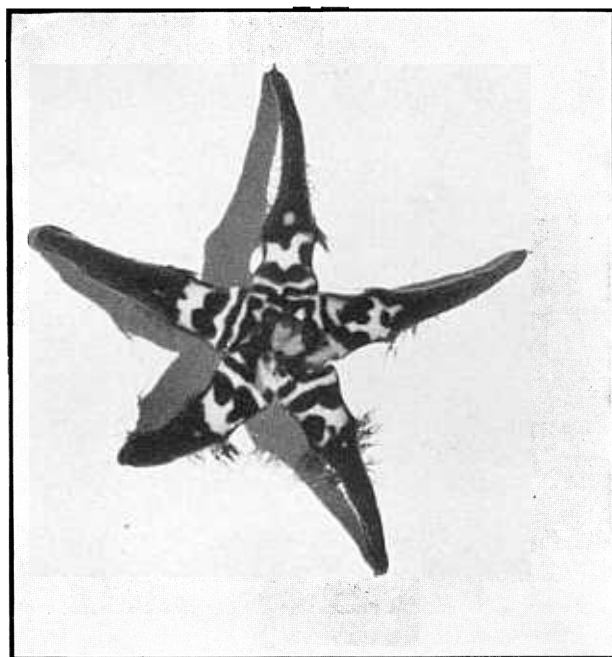


FIG. 1230

Caralluma priogonium K. Schumann (?)

Photo by B. D. Burtt. Note the four flies on disk.

R. Stapeliads in Tanganyika.

B. D. Burtt, Survey Botanist, Department of Tsetse Research, Shinyanga, has sent us a very interesting account of the plants he has collected in his country. He states that most of Tanganyika is pretty well devoid of Stapeliads, except in the north east, in the Pare Desert (inland 150 miles from the seaport of Tanga), collected upon by P. J. Greenway, Botanist at Amani, and on the Uмба Steppe, collected over by Mr. Greenway and Col. M. T. Boscawen. Some Stapeliads have also been collected in the north western section of Tanganyika, around Shinyanga, on the edge of the tsetse fly country, 100 miles south of Lake Victoria, and in the central part of the Territory, from the edge of the Massai Steppe and Kondoa-Irangi south 250 miles to Iringa. The following are the species reported by Mr. Burtt.

1. A *Caralluma* from the Pare Desert, near Mkomazi on the Tanga-Moshi Railway. The photograph in Fig. 1230 suggests that it may be the imperfectly known *C. priogonium*. The shape of the flowers, at least, conforms exactly to the details in the description given on p. 170; but nothing is there stated about the coloring, which must be peculiarly striking.

2. A *Stapelia*-like plant, growing high up on the mountains near Mkomazi Station, about 2,000 feet above the Pare Desert. It has creeping stems, very square in cross-section, with what Mr. Burtt terms the most amazing flowers he has seen.

3. An odd little creeping plant with many-angled stems (*Echidnopsis virchowii*?) from the mountains in the Pare Desert.

4. An *Edithcolea* (*E. grandis*?), on the Pare plain, in the semi-shade of succulent vegetation. There is also an *Edithcolea* on the Uмба Steppe, which is quite certainly the same species.

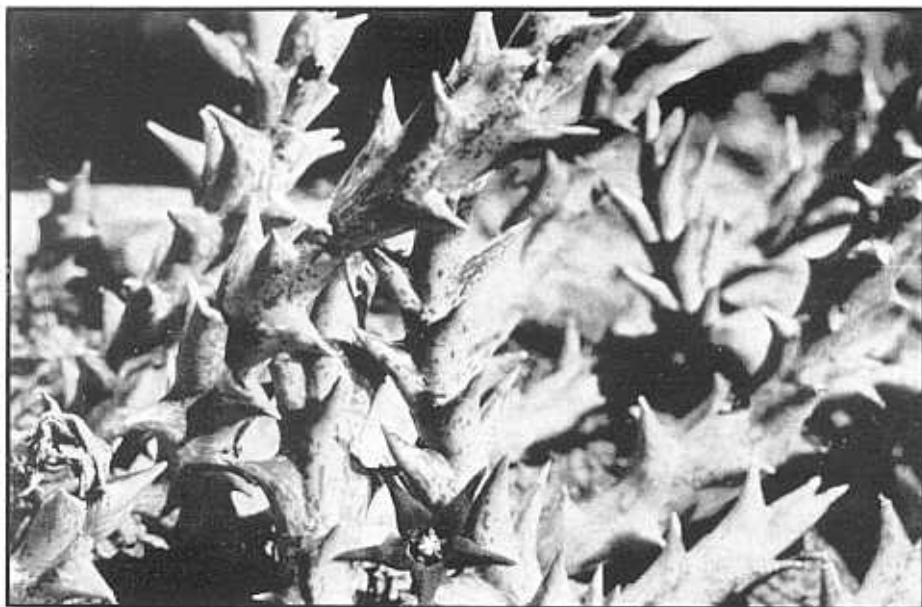


FIG. 1231

An unidentified *Caralluma* or *Stapelia*
From Shinyanga, Tanganyika. Photo by B. D. Burtt.



FIG. 1232

Caralluma piaranthoides Obermeijer (?)
From Kondoa-Irangi, Tanganyika. Photo by
B. D. Burtt.

5. An unidentified *Caralluma* or *Stapelia* from Shinyanga, see Fig. 1231. It grows in alluvial soil, which becomes water-logged in the rains, but dries like concrete in the dry season. It is usually found in the shade of small thickets and is very coraline in appearance. The stems are olive-green, flecked with brown, and the plant spreads by many underground stems. The shape of the flowers suggests *Stapelia dummeri*, but their velvety liver color is quite distinct from the *S. dummeri* flowers, and we believe the plant represents a new species.

6. A little *Caralluma*, from near Kondoa-Irangi, west of the Massai Steppe, which is also the type locality of *Stapelia semota*. This plant is almost certainly *C. piaranthoides*, hitherto known only from Southern Rhodesia. It prefers more shade than does *S. semota*, and it has a peculiar creeping habit. It produces great quantities of small but brilliant and showy small yellow flowers spotted with terracotta red, cream colored and slightly suffused with green at the centre. See Fig. 1232.

7. *Stapelia semota*, a very variable species. The type, from Kondoa-Irangi, is shown in Fig. 1233. It also grows in the Irangi district on the stony hills behind Kikari Village, on the edge of the Massai Steppe. Further to the south, between Dodoma and Mpwapwa, plants have been collected on an exposed mountain top in the rocky hills above Kikombo, in quartz gravel at 5,500 feet, with smaller flowers and extremely variable markings.

8. A Stapeliad from Massailand, resembling No. 6, but with a more robust habit and much larger flower bud. This had not yet flowered, when Mr. Burtt wrote us.

9. A lovely little *Huernia* (*H. keniensis*, or *H. aspera*?), from quartzite hills above Mpwapwa and the neighboring Kikombo, also 100 miles further south on rocks in a deep gorge near Iringa, in the famous Elton's Pass on the road to Kilosa. The plant is green in the rainy season, but turns coppery and shrivels up a lot in the dry season. The flower is liver colored, with a purple bloom on the inside. It is exquisitely colored. The plant flowers all through the rainy season, and has a creeping habit.

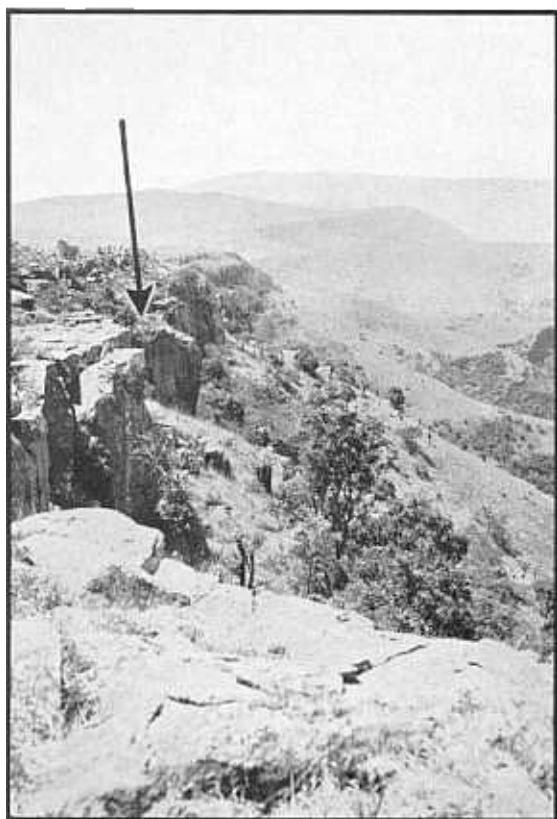
In these valuable notes, Mr. Burtt does not mention any plants which we can identify as *Caralluma codonoides*, *C. gracilipes* or *Stapelia dummeri*; and if these three are added the total count for Tanganyika will be brought up to twelve, as compared with only two species cited in the Flora of Tropical Africa.



FIG. 1233

Stapelia semota N. E. Brown

Photo by B. D. Burtt of the type plant, from Kondoa-Irangi.



Photos: G. W. Reynolds,
Johannesburg.



Huernia loeseneriana Schlechter in natural surroundings 5 miles south east of Waterval Boven, Belfast district, Transvaal. The plants, whose position is indicated by the arrows, grow under bushes on the edge, as well as in shallow pockets or crevices down the rocky face, of the krantz, or cliff, at 5,000 feet altitude in the mist belt.



FUTURISTIC.

At the close of this Second Edition of our book, we look towards the future, wondering what new species will be discovered before another edition appears. This stem of a plant received from Angola is typical of the recurring question: "Is this perchance a new thing under the sun?"

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ERRATA

p. XI, line 13	<i>for</i>	van Sommeren	<i>read</i>	van Someren
p. XIII, line 7 from bottom of page:	<i>for</i>	McGubbin	<i>read</i>	McCubbin
p. 35, line 9 from bottom of page:	<i>for</i>	Roche	<i>read</i>	Rocha
p. 144, line 3:	<i>for</i>	colector	<i>read</i>	collector
p. 268, Latin description, line 4:	<i>for</i>	sinos	<i>read</i>	sinus
p. 511, Latin description, line 3:	<i>for</i>	sinos	<i>read</i>	sinus
p. 549, Latin description, line 2:	<i>for</i>	sinos	<i>read</i>	sinus
p. 452, line 14 from bottom of page:	<i>for</i>	<i>stultitoides</i>	<i>read</i>	<i>stultitioides</i>
p. 747, line 1:	<i>for</i>	<i>pillansii</i>	<i>read</i>	<i>pubescens</i>

Readers who notice other errata will be of assistance by reporting them to us.

If circumstances permit, we hope in a few years to publish a third edition of THE STAPELIEAE. In the meantime, we will always greatly welcome additional information regarding any of the species.

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